Vol. 1033 Number 4

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UNITED STATES PATENT AND TRADEMARK OFFICE

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OFFICIAL GAZETTE of the UNITED STATES PATENT AND TRADEMARK OFFICE

August 23, 1983 Volume 1033 Number 4

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The following are mailed under direction of the Superintendent of Documents, Government Printing Office, Washington, D.C., 20402, to whom all subscriptions should be made payable and all communications addressed:

THE OFFICIAL GAZETTE (PATENT SECTION), issued weekly.

THE OFFICIAL GAZETTE (TRADEMARK SECTION), issued weekly.

GENERAL INFORMATION concerning PATENTS.

GENERAL INFORMATION concerning TRADEMARKS.

PRINTED COPIES OF PATENTS are furnished by the Patent and Trademark Office at $1.00 each; PLANT PATENTS in color, $8.00 each; copies of TRADEMARKS at $1.00 each. Address orders to the Commissioner of Patents and Trademarks, Washington, D.C., 20231.

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PATENT AND TRADEMARK OFFICE NOTICES

Patent Cooperation Treaty Information

For information concerning the PCT member countries see the notice appearing in the Official Gazette at 1017 O.G. 10 on Apr. 13, 1982. For use of the European Patent Office as a Searching Authority for PCT applications filed in the United States, see the notice in the Official Gazette of Sept. 28, 1982 at 1022 O.G. 52.

Note that the domestic PCT fees have been increased as of Oct. 1, 1982 by a rule change to 37 CFR 1.445 that was published at 1021 O.G. 11 on Aug. 10, 1982. Also note that the international PCT fees have changed as of Jan. 1, 1983 and the Search Fee for the European Patent Office as Searching Authority changed as of Jan. 22, 1983. The notice regarding the change in international fees and the Search Fee for the European Patent Office appeared at 1025 O.G. 27, on 28 Dec. 1982. The current schedule of fees is as follows:

Transmittal fee	$ 125.00
Search fee	
U.S. Patent and Trademark Office as Searching Authority	
· No corresponding prior U.S. national application filed	500.00
· Corresponding prior U.S. national application filed	250.00
European Patent Office as Searching Authority	
· All cases	670.00
International Fees	
Basic Fees (first 30 pages)	265.00
Basic Supplemental Fee (for each page over 30)	5.00
Designation fee (for each national or regional office)	65.00

GERALD J. MOSSINGHOFF,
Dec. 3, 1982. *Commissioner of Patents and Trademarks.*

REISSUE APPLICATIONS FILED

Notice under 37 CFR 1.11(b). The reissue applications listed below are open to inspection by the general public in the indicated Examining Groups and copies may be obtained by paying the fee therefor (37 CFR 1.21(b)).

4,172,963, Re. S.N. 495,377, Filed Apr. 12, 1983, Cl. 178/22.17, CHECKER AND AUTOMATIC SYNCHRONIZER FOR CODING EQUIPMENT, Harold P. Belcher, et al., Owner of Record: *ACF Industries, Inc., New York, N.Y.,* Attorney or Agent: Eugene N. Riddle, et al., Ex. Gp.: 222

4,307,953, Re. S.N. 499,969, Filed June 1, 1983, Cl. 264/165, METHOD AND APPARATUS FOR PROCESSING COMPRESSIBLE MATERIAL, John W. Daws, et al., Owner of Record: *Owens-Corning Fiberglas Corp., Toledo, Ohio,* Attorney or Agent: Ronald C. Hudgeng, et al., Ex. Gp.: 147

4,364,683, Re. S.N. 499,742, Filed May 31, 1983, Cl. 400/637, PAPER FEED ROLLER ASSEMBLY FOR A TYPEWRITER OR PRINTER, Iraj David Shakib, et al., Owner of Record: *International Business Machines Corp., Armonk, N.Y.,* Attorney or Agent: Laurence R. Letson, Ex. Gp.: 337

REQUESTS FOR REEXAMINATION FILED

Notice under 37 CFR 1.11(c). The requests for reexamination listed below are open to inspection by the general public in the indicated Examining Groups. Copies of the requests and related papers may be obtained by paying the fee therefor established in the Rules (37 CFR 1.21(b)).

In the event correspondence to the patent owner is not received, this notice will be considered to be constructive notice to the patent owner and reexamination will proceed (37 CFR 1.248(a)(5) and 1.525(b)).

Re. 30,610, Reexam. No. 90/000,370, Requested: May 5, 1983, Cl. 366/153, FLUID MIXING AND DISPENSING SYSTEM, Leonard W. Gacki, et al., Owner of Record: *Requester,* Attorney or Agent: Watts, Hoffmann, et al., Ex. Gp.: 242, Requester: Picker International, Inc., Cleveland, Ohio

3,982,261, Reexam. No. 90/000,424, Requested: July 25, 1983, Cl. 357/16, EPITAXIAL INDIUM-GALLIUM-ARSENIDE PHOSPHIDE LAYER ON LATTICE-MATCHED INDIUM-PHOSPHIDE SUBSTRATE AND DEVICES, George A. Antypas, Owner of Record: *Varian Associates, Palo Alto, Calif.,* Attorney or Agent: Stanley Z. Cole, Ex. Gp.: 253, Requester: RCA Corp., Princeton, N.J.

4,217,054, Reexam. No. 90/000,372, Requested: May 5, 1983, Cl. 366/150, FLUID MIXING AND DISPENSING SYSTEM, Leonard W. Gacki, et al., Owner of Record: *Requester,* Attorney or Agent: Watts, Hoffmann, et al., Ex. Gp.: 242, Requester: Picker International, Inc., Cleveland, Ohio

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Extension of Time for Filing Notices of Opposition to Marks Published in the Official Gazette Dated July 19, 1983

Some copies of the Official Gazette dated July 19, 1983 were not mailed until July 25, 1983. Therefore for marks published in the Official Gazette dated July 19, 1983, Notices of Opposition filed by Aug. 25, 1983 will be considered timely.

MARGARET M. LAURENCE,
July 28, 1983 *Assistant Commissioner for Trademarks.*

ARS Patent Culture Collection Initiation of Fees

As a result of recent policy changes, the ARS Culture Collection (NRRL) henceforth will charge a user fee for deposit and distribution of microbial cultures maintained in conjunction with U.S. and foreign patent applications. User fees apply to patent cultures only; as it has in the past, the ARS Culture Collection will continue to exchange other microbial germplasm with the scientific community without charge. The fee schedule will apply to all patent cultures deposited after Sept. 30, 1983. A fee of $500.00 will be charged for each strain, payable at the time of deposit. A $20.00 fee will be charged for the distribution of all released patent cultures that have been deposited after Sept. 30, 1983. There will be no charge for distribution of patent cultures already on deposit or for others received before this date. Checks, in U.S. dollars, should be made payable to the Agricultural Research Service, USDA. USDA laboratories and desig-

nated cooperators will be exempt from fee assessment. The types of microorganisms accepted by the ARS Culture Collection are the same as announced in the past and include industrially important bacteria, yeasts, molds, and *Actinomycetales*. Viruses and highly pathogenic or especially fastidious microorganisms are not accepted. Further information on types of microorganisms accepted and conditions for deposit may be obtained by contacting A. J. Lyons, Curator, ARS Patent Culture Collection, Northern Regional Research Center, USDA-ARS-NCR, 1815 N. University St., Peoria, Ill. 61604 (Tel. 309/685-4011).

PATENT NOTICES

Certificates of Correction for the Week of Aug. 23, 1983

Re. 31,113	4,346,375	4,378,152	4,384,524
3,313,658	4,347,660	4,378,192	4,384,632
3,772,242	4,356,346	4,378,260	4,384,649
3,888,932	4,357,390	4,378,602	4,384,651
4,020,250	4,360,531	4,378,733	4,384,811
4,046,798	4,360,786	4,380,571	4,384,949
4,093,446	4,361,180	4,380,844	4,385,135
4,161,928	4,364,500	4,381,269	4,385,357
4,179,665	4,365,431	4,381,291	4,385,644
4,210,540	4,365,435	4,381,484	4,385,869
4,217,043	4,366,363	4,381,624	4,385,925
4,219,352	4,367,066	4,381,676	4,386,133
4,220,468	4,367,555	4,381,678	4,386,313
4,229,172	4,367,725	4,381,805	4,386,362
4,231,212	4,370,052	4,381,823	4,386,786
4,243,843	4,372,463	4,381,999	4,387,397
4,243,866	4,372,500	4,382,976	4,387,660
4,271,941	4,374,177	4,383,191	4,387,877
4,284,626	4,374,999	4,383,390	4,388,180
4,289,404	4,375,149	4,383,434	4,388,317
4,292,183	4,375,286	4,383,869	4,388,394
4,323,371	4,376,164	4,383,949	4,388,546
4,326,874	4,376,672	4,383,978	4,389,380
4,329,512	4,376,985	4,384,093	4,389,687
4,337,408	4,377,158	4,384,196	4,389,929
4,339,799	4,377,724	4,384,269	4,390,550
4,341,229	4,378,078	4,384,444	

Reference Collections of U.S. Patents Available for Public Use in Patent Depository Libraries

The libraries listed herein, designated as patent depository libraries, receive current issues of U.S. Patents and maintain collections of earlier issued patents. The scope of these collections varies from library to library, ranging from patents of only recent months or years in some libraries to all or most of the patents issued since 1870, or earlier, in other libraries.

These patent collections are open to public use and each of the patent depository libraries, in addition, offers the publications of the patent classification system (e.g. The Manual of Classification, Index to the U.S. Patent Classification, Classification Definitions, etc.) and provides technical staff assistance in their use to aid the public in gaining effective access to information contained in patents. With one exception, as noted in the table following, the collections are organized in patent number sequence.

Depending upon the library, the patents may be available in microfilm, in bound volumes of paper copies, or in some combination of both. Facilities for making paper copies from either microfilm in reader-printers or from the bound volumes in paper-to-paper copies are generally provided for a fee.

Owing to variations in the scope of patent collections among the patent depository libraries and in their hours of service to the public, anyone contemplating use of the patents at a particular library is advised to contact that library, in advance, about its collection and hours, so as to avert possible inconvenience.

State	*Name of Library*	*Telephone Contact*
Alabama	Birmingham Public Library	(205) 254-2555
Arizona	Tempe: Science Library, Arizona State University	(602) 965-7607
California	Los Angeles Public Library	(213) 626-7555 Ext. 273
	Sacramento: California State Library	(916) 322-4572
	Sunnyvale: Patent Information Clearinghouse*	(408) 738-5580
Colorado	Denver Public Library	(303) 571-2122
Delaware	Newark: University of Delaware	(302) 738-2238
Georgia	Atlanta: Price Gilbert Memorial Library, Georgia Institute of Technology	(404) 894-4508
Illinois	Chicago Public Library	(312) 269-2865
Louisiana	Baton Rouge: Troy H. Middleton Library, Louisiana State University	(504) 388-2570
Massachusetts	Boston Public Library	(617) 536-5400 Ext. 265
Michigan	Detroit Public Library	(313) 833-1450
Minnesota	Minneapolis Public Library & Information Center	(612) 372-6570
Missouri	Kansas City: Linda Hall Library	(816) 363-4600
	St. Louis Public Library	(314) 241-2288 Ext. 214, Ext. 215
Nebraska	Lincoln: University of Nebraska-Lincoln, Engineering Library	(402) 472-3411
Nevada	Reno: University of Nevada Library	(702) 784-6579
New Hampshire	Durham: University of New Hampshire Library	(603) 862-1777
New Jersey	Newark Public Library	(201) 733-7814
New York	Albany: New York State Library	(518) 474-5125
	Buffalo and Erie County Public Library	(716) 856-7525 Ext. 267
	New York Public Library (The Research Libraries)	(212) 930-0850
North Carolina	Raleigh: D. H. Hill Library, N.C. State University	(919) 737-3280
Ohio	Cincinnati & Hamilton County, Public Library of	(513) 369-6936
	Cleveland Public Library	(216) 623-2870
	Columbus: Ohio State University Libraries	(614) 422-6286
	Toledo/Lucas County Public Library	(419) 255-7055 Ext. 212
Oklahoma	Stillwater: Oklahoma State University Library	(405) 624-6546
Pennsylvania	Philadelphia: Franklin Institute Library	(215) 448-1321**
	Pittsburgh: Carnegie Library of Pittsburgh	(412) 622-3138
	University Park: Pattee Library, Pennsylvania State University	(814) 865-4861
Rhode Island	Providence Public Library	(401) 521-7722 Ext. 226
South Carolina	Charleston: Medical University of South Carolina	(803) 792-2372
Tennessee	Memphis & Shelby County Public Library and Information Center	(901) 528-2957
Texas	Austin: McKinney Engineering Library, University of Texas	(512) 471-1610
	Dallas Public Library	(214) 749-4176
Washington	Houston: The Fondren Library, Rice University	(713) 527-8101 Ext. 2587
Wisconsin	Seattle: Engineering Library, University of Washington	(206) 543-0740
	Madison: Kurt F. Wendt Engineering Library, University of Wisconsin	(608) 262-6845
	Milwaukee Public Library	(414) 278-3043

All of the above-listed libraries offer CASSIS (Classification And Search Support Information System), which provides direct, on-line access to Patent and Trademark Office data.

*Collection organized by subject matter.

**Call only between the hours of 10:00 a.m. and 5:00 p.m.

PATENT EXAMINING CORPS

RENE D. TEGTMEYER, Assistant Commissioner

WILLIAM FELDMAN, Deputy Assistant Commissioner

CONDITION OF PATENT APPLICATIONS AS OF April 2, 1983

PATENT EXAMINING GROUPS	Actual Filing Date of Oldest New Case Awaiting Action
CHEMICAL EXAMINING GROUPS	
GENERAL CHEMISTRY AND PETROLEUM CHEMISTRY, GROUP 110—D. E. TALBERT, Director ..... Inorganic Compounds; Inorganic Compositions; Organo-Metal and Organo-Metalloid Chemistry; Metallurgy; Metallurgical Apparatus; Metal Stock; Electro Chemistry; Batteries; Hydrocarbons; Mineral Oil Technology; Lubricating Compositions; Gaseous Compositions; Fuel and Igniting Devices.	1-16-81
GENERAL ORGANIC CHEMISTRY, GROUP 120—C. E. VAN HORN, Director ..... Heterocyclic Amides; Alkaloids; Azo; Sulfur; Misc. Esters; Carbohydrates; Herbicides; Poisons; Medicines; Cosmetics; Steroids; Oxo and Oxy; Quinones; Acids; Carboxylic Acid Esters; Acid Anhydrides; Acid Halides.	11-20-81
HIGH POLYMER CHEMISTRY, PLASTICS AND MOLDING, GROUP 140—J. O. THOMAS, JR., Director .... Synthetic Resins; Rubber; Proteins; Macromolecular Carbohydrates; Mixed Synthetic Resin Compositions; Synthetic Resins With Natural Polymers and Resins; Reclaiming; Pore-Forming; Compositions (Part) e.g., Coating; Molding; Ink; Prosthdontics; Adhesive and Abrading Compositions; Molding, Shaping, Treating Process, and Apparatus Therefor; Irradiation (Part); Bleaching; Dyeing; Leather, Fur and Textile Treating Compositions.	3-1-82
COATING, LAMINATING AND PHOTOGRAPHY, GROUP 160—S. N. ZAHARNA, Director ..... Coating: Processes, Apparatus and Misc. Products; Laminating Methods and Apparatus; Stock Materials; Adhesive Bonding; Special Chemical Manufactures; Special Utility Compositions; and Photography.	3-09-82
SPECIALIZED CHEMICAL INDUSTRIES AND CHEMICAL ENGINEERING, GROUP 170—R. F. WHITE, Director ..... Fertilizers; Foods; Fermentation; Analytical Chemistry; Reactors; Sugar and Starch; Paper Making; Glass Manufacture; Gas; Heating and Illuminating; Cleaning Processes; Liquid Purification; Distillation; Preserving; Liquid, Gas, and Solid Separation; Gas and Liquid Contact Apparatus; Refrigeration; Concentrative Evaporators; Mineral Oils Apparatus; Misc. Physical Processes.	1-12-82
ELECTRICAL EXAMINING GROUPS	
INDUSTRIAL ELECTRONICS, PHYSICS AND RELATED ELEMENTS, GROUP 210—S. W. ENGLE, Director Generation and Utilization; General Applications; Conversion and Distribution; Heating and Related Art Conductors; Switches; Photography; Motion Pictures; Horology; Acoustics; Recorders; Weighing Scales.	5-22-81
SPECIAL LAWS ADMINISTRATION, GROUP 220—KENNETH L. CAGE, Director ..... Ordnance, Firearms and Ammunition; Lubrication; Illumination; Nuclear Reactors; Acoustics, Communications, Optics; Radar; Directional Radio; Torpedoes; Seismic Exploring; Cathode Ray Tube Circuitry; Cryptography; Laser Devices; Radioactive Materials; Powder Metallurgy, Rocket Fuels; Special, Fuel, Explosive and Thermic Compositions; Thermal and Photoelectric Batteries.	3-30-81
INFORMATION TRANSMISSION, STORAGE, AND RETRIEVAL, GROUP 230—EARL LEVY, Director ..... Communications; Multiplexing Techniques; Television; Facsimile; Data Processing, Computation and Conversion; Storage Devices and Related Arts.	1-05-81
RECEPTACLES, CLEANING, WINDING, AND MEASURING, GROUP 240—G. M. FORLENZA, Director ..... Receptacles; Bearings; Joint Packing; Conduits; Switches; Presses; Plumbing Fixtures; Textile Spinning; Cleaning; Food Treating; Agitating; Centrifugal Separating; Geometrical Instruments; Sound Recording; Image Projectors; Web Feeding; Winding and Reeling; Cable Hoists; Measuring and Testing; Indicating; Fluent Material Handling; Shaft; Impellers; Rotary Fluid Motors.	5-12-81
ELECTRONIC COMPONENT SYSTEMS AND DEVICES, GROUP 250—S. S. MATTHEWS, Director ..... Semi-Conductor and Space Discharge Systems and Devices, Electronic Component Circuits; Wave Transmission Lines and Networks; Optics; Radiant Energy; Measuring.	8-25-80
DESIGN, GROUP 290—KENNETH L. CAGE, Director ..... Industrial Arts; Household, Personal and Fine Arts.	1-30-81
MECHANICAL EXAMINING GROUPS	
HANDLING AND TRANSPORTING MEDIA, GROUP 310—B. R. GRAY, Director ..... Conveyors; Hoists; Elevators; Article Handling Implements; Store Service; Sheet Feeding; Dispensing; Fluid Sprinkling; Fire Extinguishers; Coin Handling; Check Controlled Apparatus; Classifying and Assorting Solids; Boats; Ships; Aeronautics; Motor and Land Vehicles and Appurtenances; Brakes; Railways and Railway Equipment.	5-18-81
MATERIAL SHAPING, ARTICLE MANUFACTURING, TOOLS, GROUP 320—STEPHEN G. KUNIN, Director Manufacturing Processes, Assembling, Combined Machines, Special Article Making; Metal Deforming; Sheet Metal and Wire Working; Metal Fusion-Bonding, Metal Founding; Machine Tools for Shaping or Dividing; Work and Tool Holders, Woodworking; Tools; Cutlery; Jacks; Fishing, Etc.; Butchering; and Books and Printed Matter.	7-27-81
AMUSEMENT, HUSBANDRY, PERSONAL TREATMENT, INFORMATION, GROUP 330—R. E. AEGERTER, Director ..... Amusement and Exercising Devices; Projectors; Animal and Plant Husbandry; Plants; Harvesting; Earth Working and Excavating; Tobacco; Artificial Body Members; Dentistry; Jewelry; Surgery; Toiletry; Printing; Typewriters; Information Dissemination.	8-27-82
HEAT, POWER, AND FLUID ENGINEERING, GROUP 340—D. J. STOCKING, Director ..... Power Plants; Combustion Engines; Fluid Motors; Reaction Motors; Pumps; Rotary Engines and Pumps; Heat Generation and Exchange; Refrigeration; Ventilation; Drying; Temperature and Humidity Regulation; Couplings; Gearing; Fluid Handling and Control; Lubrication.	11-17-80
GENERAL CONSTRUCTIONS, TEXTILES, MINING AND GEARING, GROUP 350—A. L. SMITH, Director ..... Building Structures; Racks; Cabinets; Closures; Supports; Furniture; Fasteners; Locks; Pipe Couplings; Joints; Miscellaneous Hardware; Textiles; Sewing Machines; Apparel; Footwear; Earth Engineering; Earth Drilling; Mining; Wells; Roads; Bridges; Tool Driving; Gearing; Machine Elements; Clutches.	9-17-80

Expiration of patents: The patents within the range of numbers indicated below expire during April 1983, except those which may have had their terms curtailed by disclaimer under the provisions of 35 U.S.C. 253. Other patents, issued after the dates of the range of numbers indicated below, may have expired before the full term of 17 years for the same reasons, or have lapsed under the provisions of 35 U.S.C. 151.

Patents ..... Numbers 3,243,822 to 3,248,737, inclusive

Plant Patents ..... Numbers 2,616 to 2,627 inclusive

REEXAMINATIONS

AUGUST 23, 1983

Matter enclosed in heavy brackets [ ] appears in the patent but forms no part of this reexamination specification; matter printed in italics indicates additions made by reexamination.

B1 4,200,459 (119th)

HEAT RESISTANT LOW EXPANSION ALLOY

Darrell F. Smith, Jr., Huntington, W. Va.; David G. Tipton, Wilmington, N.C.; Edward F. Clatworthy, Huntington, and Donald E. Wenschhof, Jr., Milton, both of W. Va., assignors to Huntington Alloys, Inc., Huntington, W. Va.

Reexamination Request No. 90/000,184, Mar. 29, 1982.
Reexamination Certificate for Patent No. 4,200,459, issued Apr. 29, 1980, Ser. No. 860,298, Dec. 14, 1977.
Int. Cl.[3] C22C *19/05, 30/00, 38/06, 38/48*
U.S. Cl. 75—170

AS A RESULT OF REEXAMINATION, IT HAS BEEN DETERMINED THAT:

The patentability of claims **5–18** is confirmed.

Claims **1–4** having been finally determined to be unpatentable, are cancelled.

5. An alloy consisting essentially of 34% to 55.3% nickel, up to 25.2% cobalt, 1% to 2% titanium, 1.5% to 11% metal from the group columbium, tantalum and mixtures thereof in an amount providing that the total of columbium plus $\frac{1}{2}$ tantalum is 1.5% to 5.5% of the alloy, up to 2% manganese and up to 1% chromium, up to 0.03% boron and balance essentially iron with any presence of aluminum being restricted to 0.20% or lower and wherein the composition is proportioned according to the following relationships A, B and C

A—(%Ni)+0.84(%Co)−1.7(%Ti−%Al)+
0.42(%Mn+Cr) at most 51.5

B—(%Ni)+1.1(%Co)−1.0(%Ti)−
1.8(%Mn+%Cr)−0.33(%Cb+ $\frac{1}{2}$Ta) at least 44.4

C—(%Cb+ $\frac{1}{2}$%Ta)(%Ti)−0.33(%Cr) at least 2.7.

REISSUES

AUGUST 23, 1983

Matter enclosed in heavy brackets [ ] appears in the original patent but forms no part of this reissue specification; matter printed in italics indicates additions made by reissue.

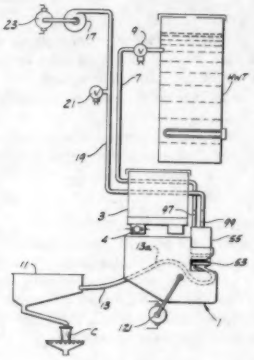
Re. 31,352
COFFEE VENDOR

John J. Kueser, Ballwin, and Dean W. Fath, Hazelwood, both of Mo., assignors to UMC Industries, Inc., Stamford, Conn.

Original No. 4,305,328, dated Dec. 15, 1981, Ser. No. 70,918, Aug. 29, 1979. Application for reissue Jun. 14, 1982, Ser. No. 388,509

Int. Cl.³ A47J *31/00*

U.S. Cl. 99—283 **15 Claims**



11. A vendor for brewing and vending coffee comprising a brewer having a relatively small-mesh screen therein dividing the brewer into upper and lower chambers, a hot-water inlet above the screen, an outlet below the screen, means for delivering hot water to the upper chamber of the brewer through the hot-water inlet, a delivery line for delivering filtered brewed coffee from the brewer through said outlet, means for forcing brewed coffee down through the screen out of the brewer and through said delivery line, and a sanitizing system comprising programming means for operation of the vendor through a sanitizing cycle comprising a series of at least two successive hot-water rinse cycles, said programming means being operable during each rinse cycle for delivering hot water to the upper chamber of the brewer, for allowing the hot water to remain in the upper chamber for a first time interval during which it seeps down through said screen into the lower chamber of the brewer and thence into and through the delivery line for rinsing and cleansing both the brewer and delivery line, and for pressurizing hot water remaining in the brewer following said first time interval for forcing it out of the brewer and through the delivery line, another of said successive hot-water rinse cycles beginning automatically after termination of said second time interval, and means for initiating operation of said programming means to begin said sanitizing cycle to sanitize said brewer and delivery line.

Re. 31,353
EXPANDING STRAP LOOP FORMING AND FRICTION FUSION MACHINE

Nelson Cheung, Arlington Heights, Ill., assignor to Signode Corporation, Glenview, Ill.

Original No. 4,062,278, dated Dec. 13, 1977, Ser. No. 752,011, Dec. 20, 1976. Application for reissue May 3, 1982, Ser. No. 374,621

Int. Cl.³ B65B *13/02*

U.S. Cl. 100—4 **14 Claims**

1. **[**An**]** *In an* apparatus for forming, tensioning, and securing a strap loop about a package, said apparatus comprising:

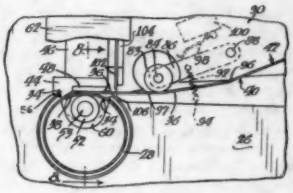
means for **[**feeding**]** *guiding* a length of strap **[**in a path**]** to form a primary strap loop with a portion of the strap loop overlapped by the free end of the length of strap;

means for restraining said free end of the strap from movement while feeding the standing length of the strap to expand the loop to a predetermined size;

means for tensioning the strap to tighten the loop about said package; and

means for joining said free end of the strap and an adjacent overlapped portion of the loop;

the improvement in the apparatus characterized in that said means for guiding the strap to form a primary loop is free of guides for acting on the inside of the loop but includes an arcuate guide member having an inner surface for acting on



the outside of the loop for guiding only one surface of the strap along the inner surface of the guide member to form said primary strap loop, said guide member defining a slot and being positionable to receive said length of a strap through said slot, said slot being open to one edge of said guide member; the improvement further characterized in that said guide member is movable relative to said restraining means; and the improvement further characterized in that said apparatus includes means for moving said guide member relative to said restraining means between a first position wherein said primary strap loop is formed and a second position spaced away from said first position to allow said primary strap loop to be expanded to said predetermined size out of contact with said guide member.

Re. 31,354
PROCESS FOR COATING METAL TUBES AND USE OF THE COATED TUBES

Günter Eckner, Hofheim am Taunus, Fed. Rep. of Germany, assignor to Hoechst Aktiengesellschaft, Fed. Rep. of Germany

Original No. 4,319,610, dated Mar. 16, 1982, Ser. No. 193,800, Oct. 3, 1980. Application for reissue Sep. 16, 1982, Ser. No. 419,035

Claims priority, application Fed. Rep. of Germany, Oct. 5, 1979, 2940388; Nov. 17, 1979, 2946459

Int. Cl.³ F16L *11/14*

U.S. Cl. 138—131 **11 Claims**

1. A process for coating preheated metal tubes with polyethylene in at least two steps, wherein a metal tube which has been preheated to a temperature of at least 200° C. and at most 250° C. is coated in a first step with polyethylene having a melt index between 1.2 and 70 g/10 min. (190° C./2.16 kg), the coating is cooled in a second step to a temperature between 110° and 170° C., and subsequently in a third step a self-supporting film of polyethylene having a melt index between 0.1 and 7 g/10 min is applied by winding round the tube at a temperature between 110° and 170° C. so that the total coating has a minimum thickness of 1.5 to 4 mm.

Re. 31,355

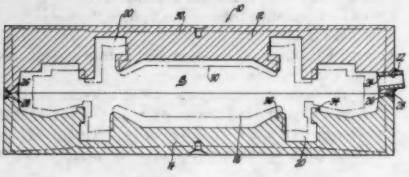
METHOD FOR HOT CONSOLIDATING POWDER

Walter J. Rozmus, Traverse City, Mich., assignor to Kelsey-Hayes Company, Romulus, Mich.

Original No. 4,142,888, dated Mar. 6, 1979, Ser. No. 778,009, Mar. 16, 1977. Continuation-in-part of Ser. No. 692,310, Jun. 3, 1976, abandoned. Application for reissue Feb. 23, 1981, Ser. No. 237,513

Int. Cl.³ B22F *3/14, 7/04*

U.S. Cl. 419—49 **16 Claims**



8. A method for hot consolidating material of metallic and nonmetallic composition and combination thereof to form a fully densified compact comprising the steps of: encapsulating a quantity of less than fully dense material in a cavity of irregular shape in a thick-walled container having a regular shape and walls entirely surrounding the cavity and of sufficient thickness so as not to follow the contour of the cavity and of a material which is substantially fully dense and incompressible and capable of plastic flow at elevated temperatures, heating the container and material to a conventional compaction temperature at which the container is capable of plastic flow and the material is susceptible to compaction and will densify and applying conventional pressure to the entire exterior surface of the container thereby causing plastic flow of the container walls to transmit pressure to the material to cause full densification at hydrostatic pressre applied by the container.

Re. 31,356

HYDRATION OF NITRILES TO AMIDES USING CUPREOUS CATALYSTS

Clarence E. Habermann, and Ben A. Tefertiller, both of Midland, Mich., assignors to The Dow Chemical Co., Midland, Mich.

Original No. 3,758,578, dated Sep. 11, 1973, Ser. No. 157,648, Jun. 28, 1971. Continuation-in-part of Ser. No. 835,765, Jun. 23, 1969, Pat. No. 3,631,104. Application for reissue Feb. 26, 1981, Ser. No. 238,395

The portion of the term of this patent subsequent to Dec. 28, 1988, has been disclaimed.

Int. Cl.³ C07C *103/00*

U.S. Cl. 564—127 **9 Claims**

1. In the process for converting an [aliphatic nitrile] *olefinic nitrile of 3 to 6 carbon atoms* to the corresponding amide by reacting the nitrile with water in the presence of a catalyst, the improvement comprising conducting the reaction in the presence of a catalytic amount of copper prepared by reducing copper hydroxide or a copper salt.

Re. 31,357

GLASS NOZZLE ARRAY FOR AN INK JET PRINTER AND METHOD OF FORMING SAME

Donald R. Cone, Palo Alto, Calif., assignor to The Mead Corporation, Dayton, Ohio

Original No. 4,112,436, dated Sep. 5, 1978, Ser. No. 771,523, Feb. 24, 1977. Application for reissue Mar. 6, 1980, Ser. No. 127,679

Int. Cl.³ G01D *15/18*; B23P *17/00*

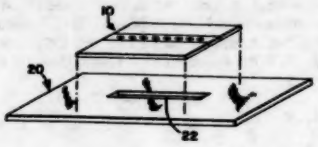
U.S. Cl. 346—75 **20 Claims**

1. A method of forming a glass nozzle array for use in an ink jet printing apparatus as part of an orifice plate, charge ring assembly or the like, the steps comprising:

supporting a plurality of cylindrical glass tubes in spaced parallel alignment;

placing a first plate *in spaced relation* beneath said tubes in a plane parallel thereto;

spreading epoxy resin through the spaces between said tubes and onto the upper surface of said first plate;



placing a second plate *in spaced relation* above said tubes in a plane parallel to said first plate and having a lower surface in contact with said epoxy resin;

curing said resin to form an assembly of said plates, tubes and epoxy;

cutting said assembly orthogonal to the axes of said tubes at a predetermined thickness to form said nozzle array.

Re. 31,358

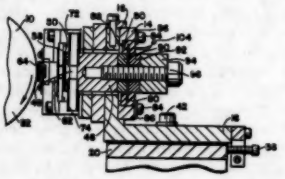
JET DROP PRINTER WITH ELEMENTS BALANCED ABOUT SUPPORT PLATE IN NODAL PLANE

Charles L. Cha, Xenia; George W. Denlinger, Stringboro; David N. Pipkorn, Centerville, and Elias Spyrou, Dayton, all of Ohio, assignors to The Mead Corporation, Dayton, Ohio

Original No. 4,198,643, dated Apr. 15, 1980, Ser. No. 970,473, Dec. 18, 1978. Application for reissue Mar. 23, 1981, Ser. No. 246,508

Int. Cl.³ G01D *15/18*

U.S. Cl. 346—75 **10 Claims**



4. A jet drop printer, comprising:

reservoir means defining an ink receiving manifold,

orifice means defining a plurality of orifices communicating with said manifold to produce a plurality of continuously flowing ink streams emerging from said orifices as ink is applied to said manifold under pressure,

drop control means for controlling the trajectories of drops which break off from said streams,

a support plate for supporting said reservoir means and said orifice means,

support structure for supporting said support plate *and said drop control means*,

vibrating means supported by said support plate for vibrating said reservoir means and said orifice means at a frequency near the natural frequency of said streams *without vibrating said drop control means*, thereby causing drops to be generated from said streams which are substantially uniform in size, and

a reaction mass supported by said support plate and positioned relative to said vibrating means, said reservoir means, and said orifice means such that a vibrational nodal plane passes through said support plate, thereby mechanically decoupling said support structure from the vibra-

tions impressed upon [the other elements of said printer] *said reservoir means and said orifice means.*

Re. 31,359

MOUNTING PEDESTAL FOR UTILITIES

Anne D. Nickola, Diane Trailer Park, G-6255 N. Saginaw Rd., Mt. Morris, Mich. 48458

Reissued No. Re. 27,400, dated Jun. 20, 1972, Ser. No. 95,002, Dec. 3, 1970.

Original No. 3,502,785, dated Mar. 24, 1970, Ser. No. 684,199, Nov. 20, 1967. Application for reissue Sep. 26, 1980, Ser. No. 191,127

Int. Cl.³ H02G *9/00;* H02B *5/02*

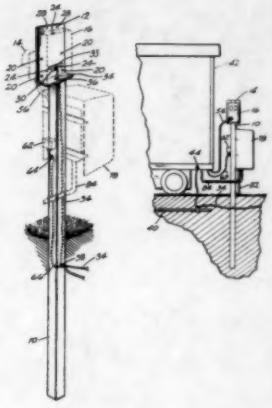
U.S. Cl. 361—332 **21 Claims**

1. An elongated hollow, **metal** post closed at one end and adapted to be partially embedded in the ground in the upright position with said closed end disposed above ground,

an L-shaped bracket carried by said post having a base portion extending across said upper end of said post and an upstanding portion for mounting an electrical meter and a power box on opposite sides of said upstanding portion, and

a ground wire carried within said post and having one end extending through said base portion for connection with said meter and said power box and an opposite end adapted for connection to a grounding means, said opposite end extending from said post at a point along the length thereof which would be below ground when the post is embedded in the ground.

33. An elongated metal post mounted in an upright position, an electrical meter and an electrical power box mounted on the upper end of said post on opposite sides thereof, a heating fuel metering means mounted to said post below said electrical meter and said electrical power box, and a ground wire having one end mounted to said power box and extending along said post with the other end mounted to a grounding means, said electrical meter, said electrical power box, and said heating fuel metering means being electrically grounded to said metal post whereby said electrical meter, said electrical power box, and said heating fuel metering means are all electrically grounded by said ground wire.



PLANT PATENTS

GRANTED AUGUST 23, 1983

Illustrations for plant patents are usually in color and therefore it is not practicable to reproduce the drawing.

5,089

ROSE PLANT

F. Harmon Saville, Rowley, Mass., assignor to Nor'East Miniature Roses, Inc., Rowley, Mass.

Filed May 27, 1982, Ser. No. 382,589

Int. Cl.³ A01H *5/00*

U.S. Cl. Plt.—7 **1 Claim**

1. A new and distinct variety of rose plant of the miniature rose class, substantially as shown and described, characterized particularly by brick red to carrot red colored flowers borne on a vigorous but low growing plant.

5,090

ROSE PLANT

F. Harmon Saville, Rowley, Mass., assignor to Nor'East Miniature Roses, Inc., Rowley, Mass.

Filed May 27, 1982, Ser. No. 382,622

Int. Cl.³ A01H *5/00*

U.S. Cl. Plt.—7 **1 Claim**

1. A new and distinct variety of rose plant of the miniature rose class, substantially as shown and described, characterized particularly by high-centered orange red and amber yellow flowers borne singly and in small sprays on a vigorous bushy plant.

5,091

ROSE PLANT

F. Harmon Saville, Rowley, Mass., assignor to Nor'East Miniature Roses, Inc., Rowley, Mass.

Filed Dec. 7, 1981, Ser. No. 328,419

Int. Cl.³ A01H *5/00*

U.S. Cl. Plt.—9 **1 Claim**

1. A new and distinct variety of rose plant of the miniature rose class, substantially as shown and described, characterized particularly by bright red flowers of heavy petalage featuring cardinal red outer petals grading to spinel red inner petals with sharply pointed petal apices particularly on middle and inner petals and flowers which are very long lasting on the plant and after cutting.

5,092

ROSE PLANT

F. Harmon Saville, Rowley, Mass., assignor to Nor'East Miniature Roses, Inc., Rowley, Mass.

Filed May 27, 1982, Ser. No. 382,590

Int. Cl.³ A01H *5/00*

U.S. Cl. Plt.—10 **1 Claim**

1. A new and distinct variety of rose plant of the miniature rose class, substantially as shown and described, characterized particularly by clean current red flowers which retain color upon opening and aging borne on a vigorous, spreading plant.

PATENTS

GRANTED AUG. 23, 1983

ERRATA

For CLASS	See PATENT NO.
406–020	4,399,817
339–018	4,400,047
420–443	4,400,209
420–443	4,400,210
420–443	4,400,211
524–176	4,400,495
377–028	4,400,615
337–380	4,400,673

PATENTS

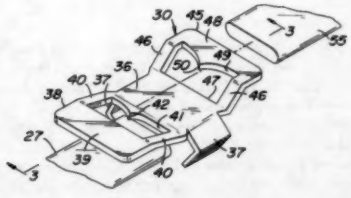
GRANTED AUGUST 23, 1983

GENERAL AND MECHANICAL

4,399,567
PREVENTIVE DEVICE OF RUBBER GLOVE AGAINST FLUID-STAIN
Sohn Weon Joong, 301-1 Soongi-2dong, Nam-Gu, Inchon, Kyonggi-province, Rep. of Korea
Filed Apr. 16, 1981, Ser. No. 254,978
Int. Cl.³ A41D *19/00*
U.S. Cl. 2—161 R **1 Claim**

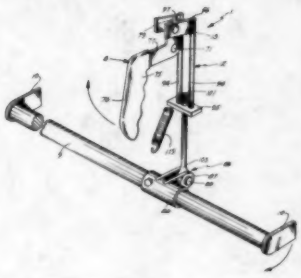
1. In a protective glove having a finger-receiving portion and an integral forearm portion, the improvement comprising a rounded, outwardly extending ring of circular cross section formed integrally at the forearm portion of said glove at a point spaced from the outer end of said forearm portion, said ring spaced from the exterior surface of said glove and connected thereto by a narrow, integral, continuous wall, said outwardly extending ring and the exterior portion of said glove defining a gutter portion on each side of said ring to collect and divert fluid flowing along said exterior portion to permit said fluid to drop from said projection and thereby divert said fluid from flowing beyond said ring.

4,399,568
BELT AND METHOD OF MANUFACTURE
Frederick W. Pfleger, 27 Cherry Ave., Maple Shade, N.J. 08052
Filed Jun. 5, 1980, Ser. No. 156,809
Int. Cl.³ A41F *9/00*
U.S. Cl. 2—322 **3 Claims**



1. A belt comprising an imperforate belt strip, a buckle at one end of said strip including an intermediate imperforate panel, and a pair of clinching arms extending from said panel laterally outwardly from opposite outer side edges of said panel and thence laterally inwardly in embracing engagement with and entering into said belt strip, the imperforate belt strip being firmly clamped by said arms in facing engagement with said imperforate panel.

4,399,569
MANUAL IN-DOOR LOCK ARRANGEMENT FOR BATHING UNITS
Raymond T. Houle, Traverse City, Mich., assignor to Silchor, Traverse City, Mich.
Filed Mar. 26, 1982, Ser. No. 362,484
Int. Cl.³ A47K *3/02*
U.S. Cl. 4—555 **27 Claims**



1. A bathing apparatus for invalids, comprising:

a bathtub having a lateral opening in a side thereof with sufficient size to permit invalid ingress and egress therethrough; said lateral opening being defined by a lip, and having a generally wedge-shaped contour which opens upwardly;

a door selectively closing said opening, and having a sealing edge with a generally wedge shape which conforms with the contour of said lip;

a compression seal connected with one of said lip and said door sealing edge;

means for vertically translating said door between an open position wherein invalid movement through said opening is permitted, and a closed position wherein said door and said bathtub are converged to compress said seal between said lip and said door sealing edge and form a seal therebetween which is leakproof when said bathtub is filled with water to a level substantially above a base portion of said lip for immersal bathing of an invalid; and

an in-door lock arrangement for selectively locking said door in the closed position, including:

a hand-operated actuator arm pivotally mounted in said door, and having a first, free end thereof positioned to be accessed from an exterior side of said bathtub, and being shaped for grasping; said actuator arm having a fully locked position and a fully unlocked position;

an elongated bar rotatably mounted within said door, and extending longitudinally across the width of said door; said bar having opposite ends positioned adjacent to opposite sides of said door;

first and second latch arms mounted on said bar adjacent the opposite ends thereof, and rotating with said bar;

first and second latch plates mounted stationary with respect to said door during door operation, and being positioned adjacent to said latch arms for abutting contact therewith;

means for operably interconnecting said actuator arm and said bar, whereby pivotal motion of said actuator arm into the fully locked position rotates said latch arms into engagement with said latch plates, and positively pulls said door into the closed position from both sides of said door; and

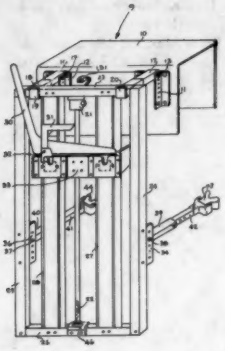
means for retaining said actuator arm in the fully locked position.

4,399,570

PORTABLE LIFT FOR HANDICAPPED PERSONS

Gary B. Tracy, 1804 Brigman St., and Geary M. Leggett, 6433 Clover Marie La., both of Anderson, Calif. 96007

Filed Nov. 16, 1981, Ser. No. 321,549
Int. Cl.[3] A47K 3/00
U.S. Cl. 4—561 8 Claims



1. A portable lift for use in aiding individuals in boarding or debarking from vehicles, or in entering and exiting pools, saunas or the like, comprising:

a structural frame constructed of two or more vertical structural members, each attached at the top to an upper horizontal structural member and at the bottom to a lower horizontal structural member;

two or more vertical slide support members, each attached at the top to said upper horizontal structural member and at the bottom to said lower horizontal structural member;

a bearing attached to said lower horizontal structural member;

a motor transmission unit attached to said upper horizontal structural member;

a threaded metal rod supported by said bearing and attached to to said motor transmission unit;

a load support system having a threaded hole through which said threaded metal rod is screwed, whereby said load support system may be raised or lowered when said threaded metal rod is turned, and further having receptacles;

sliding means rigidly attached to said load support plate and slideably attached to said vertical slide support members.

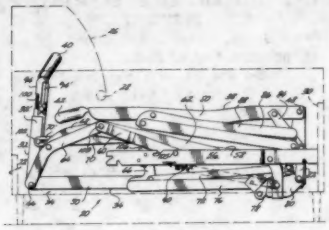
4,399,571

FOLDING BED FRAME STRUCTURE FOR SOFA BEDS OR THE LIKE

Tom B. Joyce, Mansfield, Ark., assignor to Louis Pokorny, Jr. and John M. Pokorny, both of Ronkonkoma, N.Y.

Filed Jun. 19, 1981, Ser. No. 275,490
Int. Cl.[3] A47C 17/14
U.S. Cl. 5—13 10 Claims

1. A folding bed frame structure for sofa beds or the like, comprising a plurality of bed sections pivotally connected in end-to-end relation, said bed sections including an end section and an adjacent section pivotally connected to said end section, and linkage means adapted for affixation to a sofa frame or the like and operably associated with said bed sections for supporting said bed sections on said frame and controlling movement of said bed sections in a predetermined pattern between a retracted position in which said bed sections are folded within said frame relative to one another and an extended position in which said bed sections are horizontally aligned, said linkage means including support link means pivotally connected to said adjacent section for supporting said end and adjacent sections, and actuating link means pivotally affixed to said end section at a spacing from said pivotal connection thereof with said adjacent section for transmitting movement of said linkage means to said end section, said actuating link means resting upon said support link means, when said bed



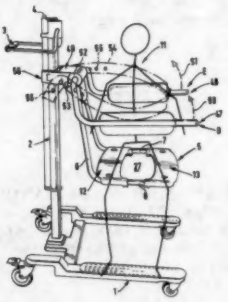
sections are in their extended position, to supportingly brace said end section in horizontal alignment with said adjacent section and to prevent pivotal downward movement of said end section about said pivotal connection thereof with said adjacent section beyond said horizontal alignment.

4,399,572

SEAT OF A PATIENT-LIFTING DEVICES

Hans A. V. Johansson, Box 61, Eslov, Sweden S-241 00

Filed Apr. 22, 1981, Ser. No. 256,474
Claims priority, application Sweden, May 5, 1980, 8003342
Int. Cl.[3] A61G 7/08
U.S. Cl. 5—81 R 10 Claims



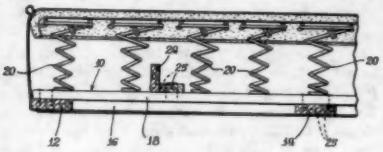
1. A seat for a patient-lifting device, the seat comprising a carrier frame (6) mounted on a hoisting gear (2) and having support means (9 and 10) running between outwardly extending carrier frame portions (7 and 8), said carrier frame (6) comprising two separate sitting means (12 and 13) spaced from each other to provide a seat with an opening (27) therein, whereby each sitting means (12 and 13 respectively) and/or the carrier frame (6) has a coupling device (14 and 15 respectively) adapted to permit fixing of the sitting means (12 and 13 respectively) above the support means (9 and 10 respectively) by moving the sitting means (12 and 13 respectively) into engagement with the carrier frame (6) and whereby each sitting means (12 and 13 respectively) and/or the carrier frame (6) has a position indicator (15, 16 and 17, 18 respectively) arranged such that any one from above may determine whether the sitting means (12 and 13 respectively) is in-fixed position (A and B respectively) above the support means (9 and 10 respectively).

4,399,573

REINFORCED BOX SPRING FRAME

Leslie I. Baright, Atlanta, Ga., assignor to Simmons U.S.A. Corporation, New York, N.Y.

Filed Feb. 21, 1980, Ser. No. 123,261
Int. Cl.³ A47C 23/04, 23/06
U.S. Cl. 5—239 2 Claims



1. In a box-spring, a wooden base frame comprising a rectangular border and a plurality of cross-slats secured thereon for supporting an assembly of upholstery springs adapted when upholstered to provide resilient foundation for a mattress;

deflection-reducing reinforcement comprising at least one longitudinally-extending beam spanning the upper side of said frame from border to border atop the cross-slats and projecting upwardly from the cross-slats and between springs and within the assembly of springs thereon,

said beam being formed of at least two wooden slats positioned respectively as an upstanding web and a flange extending laterally therefrom with the web positioned alongside the flange and secured thereto by metal fasteners driven through the face of the web into the edge of the flange, and

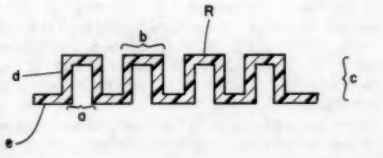
said beam secured to each of said cross-slats.

4,399,574

NOVEL MATTRESS PAD

Joseph G. Shuman, 20 Highlander Dr., Scotch Plains, N.J. 07076

Filed Jan. 6, 1981, Ser. No. 222,921
Int. Cl.³ A47C 21/00, 27/00
U.S. Cl. 5—417 1 Claim



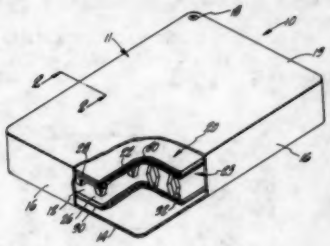
1. A pad for mattresses, cushions and the like which consists of a plurality of ribs, separated by troughs, said pad being made of an elastomeric material having a Shore A hardness between 75 and 95, the overall size of the pad being adequate to provide back support for the user when the pad is arranged with the ribs in a direction perpendicular to the spinal cord of the user and also providing flexibility in the longitudinal direction, said pad being a flat flute corrugated structure, the peaks of the corrugations forming the ribs, the flexibility modulus of said elastomeric material as tested by ASTM-D-790 being 25,000–45,000 p.s.i., the distance between two adjacent ribs being between ¼ and ½ inches, and the length between the top of a rib and the bottom of a through being between ¼ and one inch.

4,399,575

WATERBED MATTRESS WITH UNATTACHED BAFFLE STRUCTURE

Charles P. Hall, Muir Beach, Calif., assignor to Monterey Manufacturing, Inc., Los Angeles, Calif.

Continuation-in-part of Ser. No. 201,304, Oct. 27, 1980, and Ser. No. 95,214, Nov. 19, 1979, Pat. No. 4,345,348, which is a continuation-in-part of Ser. No. 949,963, Oct. 10, 1978, Pat. No. 4,247,962, said Ser. No. 201,304, is a continuation-in-part of Ser. No. 95,214,. This application Apr. 3, 1981, Ser. No. 250,733
The portion of the term of this patent subsequent to Aug. 24, 1999, has been disclaimed.
Int. Cl.³ A47C 27/08
U.S. Cl. 5—450 19 Claims



1. In a waterbed mattress having an enclosing structure comprising a horizontally extending top wall and a horizontally extending bottom wall, the improvement comprising a free-floating baffle structure comprising:

(a) a horizontally extending buoyant pad disposed within the enclosing structure for limiting the motion of water in the mattress, the pad having a horizontal extent corresponding generally to the sleeping surface of the mattress;

(b) means anchoring the pad comprising:

(i) a flexible sheet overlying the pad;

(ii) an anchor sheet denser than water underlying and spaced apart from the pad, the anchor sheet not being secured to the enclosing structure and having a horizontal extent corresponding generally to the sleeping surface of the mattress; and

(iii) connecting means affixed to the overlying sheet and the anchor sheet and passing through the pad; and

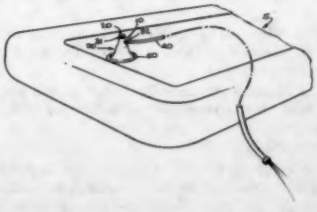
(c) a porous mass of bound together fibers between the anchor sheet and the pad.

4,399,576

FLOTATION MATTRESS INCORPORATING DRAIN/FILL VALVE

Milton A. Callaway, Medford, Oreg., assignor to Simmons U.S.A. Corporation, Atlanta, Ga.

Filed Feb. 17, 1981, Ser. No. 235,222
Int. Cl.³ A47C 27/08; F16K 15/20
U.S. Cl. 5—451 3 Claims



1. A flotation mattress comprising valve means retractably

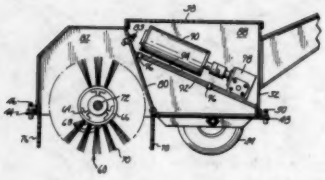
secured thereto, said valve means including a resilient neck portion and a valve portion secured to said neck portion, said valve portion including a vertical top port and a horizontal side port, said neck portion and said valve portion defining an annular containment well beneath the surface of said flotation mattress, a collapsible hose wrapped about said valve portion and within said containment well, said hose being connected to said horizontal side port and wrapped about said valve portion above said side port.

4,399,577

MACHINE FOR CLEANING GRATING OVER BARN MANURE TROUGH

Clayton C. Pyle, 4425 W. 84th St., Bloomington, Minn. 55431, and Bobby R. Wigelsworth, 4336 High View Pl., Minnetonka, Minn. 55343

Filed Oct. 5, 1981, Ser. No. 308,914
Int. Cl.³ A47L *11/18*
U.S. Cl. 15—49 C **18 Claims**



1. For use in a barn having animal stalls, an apparatus for cleaning grate over barn floor manure troughs comprising:

a housing adapted for movement;

a cylindrical, grate-engaging brush having a cylindrical core of about eight inches in diameter and dense, fibrous, resilient silicon carbide bristles of about forty mils in diameter and about four inches in length projecting outward from the core, the brush being mounted in the housing for rotation about a first horizontal axis generally perpendicular to the movement of the housing;

means for rotating the brush;

means for spraying water generally downward onto the grate;

means for spraying water on the brush;

a pair of rotatable wheels connected to the housing for rotation about a second horizontal axis which is parallel to and rearward of the first horizontal axis; and

a rotatable guide wheel mounted on the housing forward of the brush.

4,399,578

TOOL FOR CLEANING BATHTUB

Willard A. Bordeaux, 4001 E. McDowell, Apt. 144, Phoenix, Ariz. 85008

Filed Aug. 21, 1981, Ser. No. 295,112
Int. Cl.³ A47L *25/00*; A46B *13/02*
U.S. Cl. 15—97 R **9 Claims**

1. A manually manipulated tool for cleaning a bathtub, said tool

enabling an individual to readily reach and clean inner vertical and horizontal surfaces of the bathtub while standing adjacent thereto, and

requiring a minimal amount of exertion on the part of and being easily manipulated by an individual utilizing said tool,

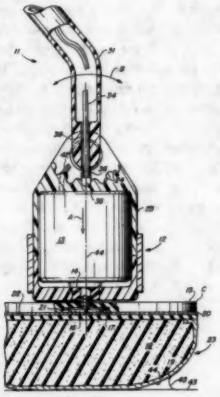
said tool comprising,

(a) a cleaning head including a rotary circular pad for contacting and cleaning the inner surfaces of said bathtub, said circular pad being resiliently compressible to facilitate said cleaning head's adapting to and traversing the inner curved surfaces of said bathtub, said cleaning head having an operative position in which

(i) said cleaning head is oriented with said rotary circular pad resting on a generally horizontal bathtub surface, and

(ii) said cleaning head includes a point representing the center of gravity thereof, said point lying along an imaginary vertical axis passing through said cleaning head and perpendicular to said horizontal bathtub surface when said cleaning head is oriented in said operative position;

(b) an elongate rod having a first end including a handle, center portion and second end, said second end being pivotally attached to said cleaning head at a point generally lying along said imaginary vertical axis passing through said cleaning head such that when said cleaning head is raised from said horizontal surface into the air the



orientation of said head with respect to said imaginary vertical axis remains generally fixed, said vertical axis being perpendicular to said horizontal surface of said bathtub;

(c) releasable locking means including (i) cooperating means between said second end of said rod and said head for releasably locking said head in a plurality of fixed positions with respect to said second end to prevent pivotal movement of said second end with respect to said head, and (ii) adjustment means extending through said elongate rod between said cooperating means and said handle to enable the control from said handle of said cooperating means to position said head in said plurality of fixed positions; and

(d) motor means integrated in said tool for supplying motive power to drive said rotary circular pad and including a depending rotatable member for carrying said circular pad and imparting motive power thereto.

4,399,579

LINT REMOVER

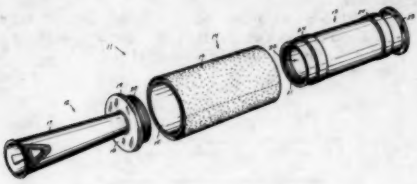
Nicholas D. McKay, Grand Blanc, Mich., assignor to Helmac Products Corporation, Flint, Mich.

Filed Aug. 6, 1981, Ser. No. 290,780
Int. Cl.³ A47L *25/00*
U.S. Cl. 15—104 A **7 Claims**

1. In a lint remover assembly, the combination comprising:

an adhesive taper roll sleeve-engaging hollow cylinder container being open at one end thereof, said cylinder container defining a storage compartment therein; and

an elongate handle member in axially aligned end-to-end selectively fixed engagement with said open end of said



cylinder container so as to selectively effect closure of said storage compartment.

4,399,580

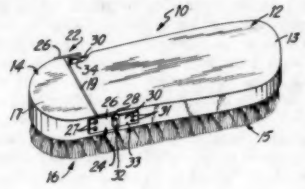
TWO PART SHOE BRUSH

Robert Stark, 4714 11th Ave., Brooklyn, N.Y. 11219

Filed Jun. 29, 1981, Ser. No. 278,626

Int. Cl.³ A46B *9/10, 15/00*

U.S. Cl. 15—107 **3 Claims**



1. A combined brush and dauber arrangement comprising:

first and second brush sections which matingly assemble to provide a composite conventional shoe brush configuration, one of said brush sections operatively defining a dauber;

first and second coupling means associated with said first and second brush sections for releasably securing said brush sections together so that said sections can be selectively disengaged to permit independent usage of at least one of said brush sections, and so that said brush sections can be selectively rejoined for usage of said dauber and for storage;

said first and second brush sections including respectively first and second base members with bristles depending therefrom, respective medial end surfaces of said first and second members confrontingly abutting each other in an assembled condition;

said first and second coupling means being positioned on opposite sides of said brush sections, each of said coupling means straddling across its respective base members of said first and second brush sections;

said first and second coupling means including respectively first and second brackets coupled to opposite sides of said first base member and extending cantileverly therefrom across to associated opposite sides of said second base member, and first and second grasping means on said opposite sides of said second base member for securing respectively onto said first and second brackets;

each of said first and second brackets including a transverse slot in a distal free end, said first and second grasping means including first and second hook members coupled to the opposite sides of said second base member for hooking respectively in said slots to lock said brush sections together;

each of said hook members being a strip of material having a bend at one end to define a hook, and being provided with a width approximately equal to the length of its associated transverse bracket slot;

said first bracket and said first hook member being disposed on adjacent sides of said base members, said first bracket and said first hook member engaging together to provide hinge means for pivoting opposite adjacent sides of said base members together so that said medial end surfaces of said first and second base members confrontingly abut with each other;

said second hook member being resilient and being cantileverly disposed over a cutaway portion in said second base member, said cutaway portion extending from said medial end surface of said second base member to the opposite side of said second base member adjacent said second hook member to provide clearance means to permit deflection of said second hook member therein for engagement and disengagement of said second hook member in said slot of said second bracket when said first bracket and said first hook member are engaged; and

said confrontingly abutting medial end surfaces of said first and second base members being complementary tapered relative to each other to prevent relative longitudinal and transverse movement between said base members in the assembled condition.

4,399,581

PLASTER SURFACE FINISHING DEVICE

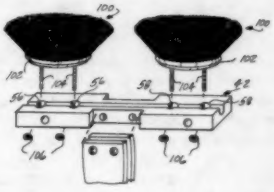
Carmen J. Tuzzolino, 37009 Gary, Sterling Heights, Mich. 48077

Division of Ser. No. 76,365, Sep. 17, 1979, Pat. No. 4,258,898.

This application Sep. 22, 1980, Ser. No. 189,809

Int. Cl.³ B25G *1/00;* **A46B** *17/00*

U.S. Cl. 15—176 **1 Claim**



1. A device for finishing a wet plaster surface comprising:

a finishing tool holder comprising a lower end including a handle engaging means; the holder broadening to a planar fan shape at an upper end thereof; an upper portion of the holder including the planar fan notched creating a step; a filler piece complementary to and substantially filling the notch; a threaded insert in the holder proximate a lower end of the notch; an aperture formed in the filler piece aligned with the threaded insert; a threaded fastener slidingly engaging the aperture in the filler piece and threadingly engaging the threaded insert to loosely attach the filler piece to the holder; and

a first pair of spaced apertures formed through the holder at the upper portion thereof, and a second pair of apertures formed through the filler aligned with the first pair of apertures;

a cross bar snugly retained between the holder and the filler piece;

a pair of recesses formed in the cross bar to receive the upper end of the holder and the filler piece;

a fourth pair of spaced aperture formed in the recess aligned with the first and second pairs of apertures;

a pair of threaded fasteners slidingly engaging the aligned apertures, and a pair of nuts engaging the threaded fasteners to secure the cross bar to the holder;

a groove formed along an upper wall of the cross bar extending vertically below the third pair of apertures;

a fourth pair of spaced apertures formed through the cross

bar parallel to the third apertures proximate the ends of the cross bar and crossing the groove; and

two pairs of vertical spaced apertures parallel and central to the grove formed in the cross piece spaced in from the ends thereof;

a pair of circular brushes including a handle portion;

a pair of threaded studs aligned with the two pairs of vertical spaced aperture, each pair of studs affixed to each handle portion, the studs slidingly engaging the vertical apertures, and a plurality of nuts threadingly engaging the studs to secure the circular brushes to the cross bar; and

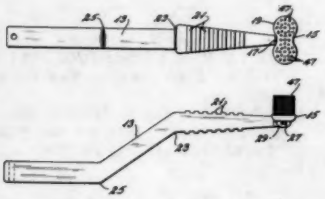
whereby the circular brushes can be employed to produce a circular stippled surface in the plaster.

4,399,582

MODULAR INTERPROXIMAL TOOTHBRUSH SYSTEM

Raymond Ernest, 680 NE. 64th St., Miami, Fla. 33138, and Stephen J. Ginsburg, 7 Lehigh Rd., Wellesley, Mass. 02181

Filed Mar. 9, 1981, Ser. No. 241,943
Int. Cl.³ A46B *9/04, 9/10*
U.S. Cl. 15—176 **1 Claim**



1. A toothbrush construction having the capability for simultaneously penetrating the innerproximal spaces and the free gingival margins of the teeth of both the maxillary and the mandibular arches comprising:

(a) at least one elongated bristle bearing head having a major axis extending between opposite ends of said head, said bristle-bearing head comprising a back having a substantially flat surface, a plurality of bristles projecting from said flat surface in a predetermined arrangement bilaterally symmetrical with respect to a minor axis of the head, the predetermined bristle arrangement including a wedge-like configuration having an apex located adjacent each of the opposite ends, the bristles around the perimeter of said bristle-bearing head at the apices having a thickness which is less than the average thickness of the remainder of the bristles in order to reduce the firmness and abrasive qualities of these bristles;

(b) a means for detachably attaching the head to a stem, the stem having a longitudinal axis and first and second straight end portions spaced apart and in parallel and connected by an angularly disposed straight middle portion, the attachment being disposed at the distal end of said first straight end portion so that when the head is attached to the stem, the stem's longitudinal axis is coaxial with respect to the minor axis of the head, the first straight end portion of said stem being provided with a series of ridges to facilitate gripping of the stem near said head;

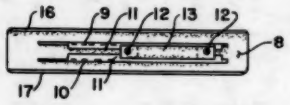
(c) a mid portion of the head located between the apices, the length of the mid portion along the major axis being such as to position each apex at the gingival margin at each of the edges when the mouth is at an open position and the stem disposes the longitudinal apices in the occlusal plane, wherein the head can be readily removed from the stem and replaced with other heads having either the same configuration or a different configuration.

4,399,583

HAND FLOAT

Jack D. Jarvis, Memphis, Tenn., assignor to Aluma-Form, Inc., Memphis, Tenn.

Continuation-in-part of Ser. No. 174,569, Aug. 4, 1980. This application Oct. 26, 1981, Ser. No. 316,062
Int. Cl.³ B05C *17/10;* **E01C** *19/12*
U.S. Cl. 15—235.8 **2 Claims**



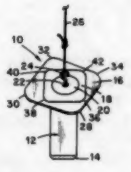
1. In an hand float for use in finishing concrete and the like and including a plate means useful for application upon concrete during its smoothing operations and for its finishing, and having a handle connected therewith, the improvement comprising said handle being releasably connected with the plate and slideably adjustable therewith to provide for its positioning at differing locations along its length for the convenience of its user, said plate having a pair of spaced apart guides securing upon its upper side, said guides having inturned edges provided along their upper edges, releasable fastening means provided upon the handle for securing the handle with the plate means after adjustment, one of each fastening means being located proximate each end of the handle, each fastening means including a combined nut and bolt, said combined nut and bolt at each end of the handle means provided for insertion and tightening into the plate means guides, each bolt of the fastening means including a T-shaped head for facilitating their accommodation within said guides, said guides provided upon the plate means having tapering ends, to provide for the ease of assembly of the handle into the guide means during insertion and adjustment.

4,399,584

APPARATUS FOR CLEANING FLUES

Bruce L. Batson, Straton Lake Rd., Ashland City, Tenn. 37015

Filed Jul. 24, 1981, Ser. No. 286,630
Int. Cl.³ F23J *3/00*
U.S. Cl. 15—243 **5 Claims**



1. A flue cleaning apparatus for being lowered into and withdrawn from a flue to remove soot therefrom;

a weight having a diameter substantially less than the diameter of the flue and having a top;

a first plate having a first maximum diameter;

a second plate disposed adjacent and parallel with said first plate with facing portions of said plates in contact with each other and said second plate having a second maximum diameter greater than said first maximum diameter so that said flue cleaning apparatus may be adjusted for flues of differing diameters by removing said second plate from said weight;

said first and second plates having a plurality of rounded corners formed thereon and being dimensioned with a maximum diameter of slightly less than the diameter of the flue so that when said plate is inserted into the flue, spaces

are formed between the flue and said plate at positions between adjacent rounded corners of said plate;

means for attaching the centers of said first and second plates to the top of the said weight;

a rope; and

means for attaching said rope to the weight at a position adjacent the center of said plate for lowering and withdrawing said weight and plates into and from said flue to scrub the rounded corners of said first plate against the interior of said flue to dislodge soot therefrom with said dislodged soot falling down the flue and around said plate through the spaces formed between adjacent rounded corners.

4,399,585

VACUUM CLEANER WITH CONSTANT AIR FLOW

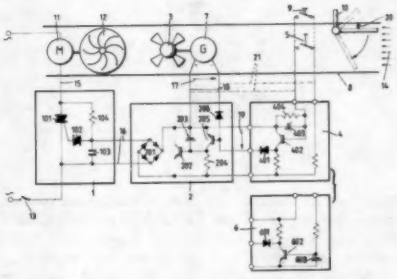
Günter R. J. Kullik, Meinerzhagen; Werner Dürr, Leonberg, and Robert Maier, Nufringen, all of Fed. Rep. of Germany, assignors to Progress-Elektrogeräte Mauz & Pfeiffer GmbH & Co., Stuttgart, Fed. Rep. of Germany

Filed Sep. 7, 1981, Ser. No. 291,102

Claims priority, application Fed. Rep. of Germany, Aug. 8, 1980, 3030059

Int. Cl.³ G05D *7/06*; A47L *5/22*; H02P *7/28*

U.S. Cl. 15—319 **14 Claims**



1. A vacuum cleaner with constant air flow for home and industry, comprising:

a suction channel for suction air flow;

a suction fan mounted in said channel for generating a working air flow in the form of said suction air flow;

an electric motor for driving said suction fan;

an air-flow measuring device arranged in said suction channel in said suction air flow, said air-flow measuring device generating an electrical output signal which is proportional to said suction air flow;

a regulating and control circuit associated with said electric signal generating device in the suction channel for receiving said electrical output signal and for adjusting motor speed as to suction fan capacity of said suction air flow to a predetermined value as a function of said signal, said electric motor, with its adjoining suction fan, said air-flow measuring device, and said associated regulating and control circuit forming a closed control system, said regulating and control circuit being embodied in such a way relative to the electric signal generating device so as to keep said suction fan capacity of said suction air flow constant, said air-flow measuring device including an air turbine, and a generator which is driven by said air turbine and generates said electrical ou.put signal, which is conveyed as a control voltage to said regulating and control circuit, and in response to which said circuit alters the speed of said electric motor and said suction fan.

4,399,586

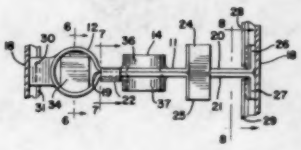
DUAL WHEEL CASTER

Raymond A. McCarroll, Grosse Point Woods, Mich., assignor to Herder, N.V., Curacao, Netherlands Antilles

Continuation-in-part of Ser. No. 15,894, Feb. 28, 1979, abandoned. This application Sep. 19, 1979, Ser. No. 76,831

Int. Cl.³ B60B *33/00*

U.S. Cl. 16—31 R **16 Claims**



1. A caster body assembly comprised of a body frame member of one piece integral construction and a separate fender member, said body frame member being of multi-ply construction shaped to conform to and support the fender member and having an axle bearing formed therein, a vertical swivel stem socket disposed adjacent the leading edge of the body frame formed integral with the plies of said body frame member at one side of the body frame member and extending upwardly through the fender member, said fender member and frame member having cooperating means securing the fender to the body frame member adjacent said one side including a pair of oppositely extending brackets integral respectively with the body frame member plies, a flange on the fender engaged with said brackets on opposite sides of the body frame member, cooperating means at the other side of the body frame securing the fender thereto, and a pair of supporting wheels disposed respectively upon opposite sides of said body frame member mounted on an axle extending horizontally through said bearing.

4,399,587

DEVICE FOR AUTOMATICALLY BRINGING THE PIVOTING WHEELS OF A MANUAL TRUCK BACK TO A PREDETERMINED DIRECTION

Jacques P. Penifaure, Creil, France, assignor to Saxby, Paris, France

Filed Mar. 25, 1981, Ser. No. 247,286

Claims priority, application France, Mar. 28, 1980, 80 07025

Int. Cl.³ B60B *33/00*

U.S. Cl. 16—35 D **4 Claims**

1. A device for automatically returning the pivoting wheels of a manual truck to bring them back to a predetermine direction, comprising:

(a) a base,

(b) a wheel,

(c) a fork,

(d) means for rotatably supporting said wheel in said fork,

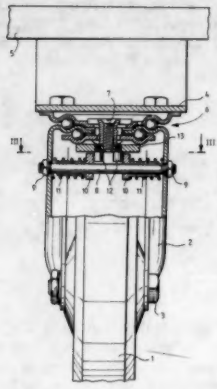
(e) means for mounting said fork on said base for pivotal movement about a vertical axis, and

(f) means for biasing the fork to a predetermined alignment, comprising:

(i) a cylindrical rod carried by said fork parallel to the axis of rotation of said wheel,

(ii) a cam fixed with respect to said base and lying within said fork,

(iii) shoes means slidable on said rod for engaging said cam, and



(iv) compression spring means for resiliently urging said shoe means against said cam.

4,399,588

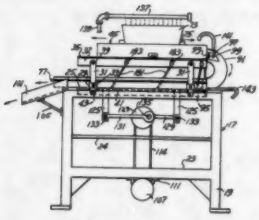
AUTOMATIC FISH FEEDER AND ORIENTATOR

Robert Molnar, Windsor, Canada, assignor to Simnar, Inc., Windsor, Canada

Filed Jul. 30, 1981, Ser. No. 288,628

Int. Cl.³ A22C *25/12*; B65G *47/24*

U.S. Cl. 17—64 **23 Claims**



1. An automatic fish feeder and orientator adapted for continuously delivering fish into an automatic fish scaler comprising a framework mountable upon a floor and including a pair of laterally spaced top rails;

opposed longitudinally spaced pairs of substantially upright support arms intermediate their ends pivotally mounted upon said rails respectively;

an elongated reciprocal feed table overlying said framework and along opposite sides pivotally connected to and supported upon the upper ends of said support arms, respectively;

a horizontally disposed reciprocal feed plate overlying said framework spaced below said table and along its opposite sides pivotally connected to the lower ends of said support arms, respectively;

an elongated fish receiver having an upright side walls with an open top and bottom centrally mounted upon and secured to said table longitudinally thereof, said side walls terminating in a throated converging fish outlet adjacent one end of said table;

an elongated fish delivery channel mounted upon and secured to said feed plate along its length underlying said receiver and projecting outwardly of the end of said feed plate opposite from said receiver outlet;

a tubular feed chute of arcuate shape supported upon said table at one end communicating with said receiver outlet, with its other end loosely projected into and communicating with said delivery channel;

power means on said framework connected to and horizontally reciprocating said feed plate;

and gill engaging means mounted upon said table within said receiver and mounted within and along said delivery channel for supporting and intermittently feeding the fish head first in one direction longitudinally of said receiver through said outlet and into said chute and intermittently feeding the fish head first in the opposite direction from said chute and longitudinally of and along said delivery channel and outwardly of one end thereof.

4,399,589

TRAVERSING APPARATUS FOR A CUTTING MACHINE FOR A SYNTHETIC FILAMENT TOW

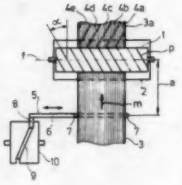
Walter Hefti, Winterthur, Switzerland, assignor to Rieter Machine Works Ltd., Winterthur, Switzerland

Filed Jul. 13, 1981, Ser. No. 282,959

Claims priority, application Switzerland, Jul. 29, 1980, 5776/80

Int. Cl.³ D01G *1/04*

U.S. Cl. 19—0.6 **5 Claims**



1. Traversing apparatus for a cutting machine for a synthetic filament tow with a pair of cutting rolls (**1/2**) defining a cutting line (f) and consisting of a cutting roll (**1**) and a pressure roll (**2**), in which arrangement the cutting roll is provided with cutting edges wound helically onto its surface, extending mutually parallel at equal distances, and with a tow guide (**5**; **11,12**; **15,16**), traversing parallel to the cutting line (f), arranged, seen in the direction of material flow, upstreams from the cutting line (f), on which guide the filament tow (**3**) laid-out as a wide filament layer is guided on both sides, and which guide effects the traversing movement engaged into the guide-groove (**9;13**) provided in the sleeve of a rotating grooved drum (**10**; **14**; **17,18**), characterized in that the shape of the guide-groove (**9;13**), unrolled onto a plane, fulfils the following relation:

$$b = \pm a \cdot tg\left[\alpha\text{-arc sin}\left(\frac{180 \cdot \bar{L} \cdot \sin\alpha}{180 \cdot L_{max} - \theta(L_{max} - L_{min})}\right)\right]$$

where

b=traversing path length of the tow guide (**5**; **11,12**; **15,16**)

a=distance between the tow guide (**5**; **11,12**; **15,16**) and the cutting line (f)

α=helix angle of the cutting edge

L_{max}=maximum fibre length in the cut fibre array (**3***a*)

L_{min}=minimum fibre length in the cut fibre array (**3***a*)

ν=centre angle of the unrolled drum surface

L=cutting roll staple length=(cutting roll dia·π)/G=T/sin α

where

T=distance between two adjacent cutting edges

G=number of cutting edge wraps.

4,399,590
METHOD AND APPARATUS FOR CHECKING A BLENDING PLANT FOR TEXTILE STAPLE FIBRES

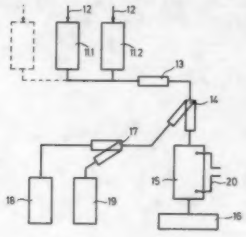
Rudolf Wildbolz, Winterthur, Switzerland, assignor to Rieter Machine Works Ltd., Winterthur, Switzerland

Filed Jul. 13, 1981, Ser. No. 282,957

Claims priority, application Switzerland, Jul. 23, 1980, 5610/80

Int. Cl.³ D01G *13/00*

U.S. Cl. 19—145.5 **12 Claims**



1. A method of checking a blending plant for textile staple fibers of different types, comprising the steps of:

transporting each type of fiber by means of a respective fiber metering unit to a blending device;

blending the fibers received from said fiber metering units in said blending device;

transporting the blended fibers from the blending device into a storage device from which the blended fibers are removed;

delivering quantities of the blended fibers from the blending device to the storage device during the times of supplying the blended fibers between the blending device and the storage device which are somewhat greater than the fiber quantity removed from said storage device;

interrupting the fiber supply of blended fibers to the storage device during repeated time intervals;

during at least certain of said time intervals causing the metering units supplying the different types of fibers to the blending device to supply fibers thereto individually and in succession;

utilizing the fibers supplied individually and in succession by each of the metering units to the blending device for checking the quantity of fibers supplied by each of the metering units during a normal blending operation;

during partial time periods within the repeated time intervals, during which there prevails a substantially constant fiber supply from at least one of the metering units to be checked, supplying the entire production of fibers from said at least one metering unit, to a quantity measuring device; and

measuring the entire production of fibers supplied by said at least one metering unit to the quantity measuring device therein.

4,399,591
EXTRACTOR-FEEDER

Robert C. Schwartz, and John E. Sparks, both of Lubbock, Tex., assignors to Horn & Gladden Lint Cleaner Company, Inc., Lubbock, Tex.

Filed Mar. 15, 1982, Ser. No. 357,980

Int. Cl.³ D01G *1/00*

U.S. Cl. 19—202 **10 Claims**

5. An extractor-feeder having

(a) two feed rollers,

(b) at least two scrub cylinders,

(c) said scrub cylinders located beneath said feed rollers,

(d) grid bars beneath said scrub cylinders whereby seed cotton fed by the feed rollers is scrubbed across the grid bars by the scrub cylinders in succession,

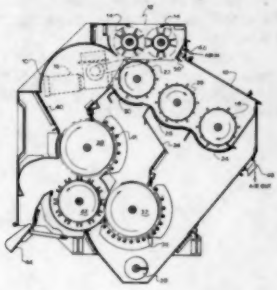
(e) a main saw cylinder,

(f) a reclaiming saw cylinder,

(g) means for directing the cotton from the final scrub cylinder onto the main saw cylinder,

(h) saw bar means for extracting trash from said main saw cylinder,

(i) means for directing the extracted trash from the saw cylinder onto the reclamation saw, and



(j) means for doffing seed cotton from the reclamation saw and main saw cylinder;

wherein the improvement comprises:

(k) one scrub cylinder having the grid bars closely-spaced apart,

(l) another scrub cylinder having wide-spaced grid bars spaced apart by a wider spacing than the closely-spaced bars, and

(m) means to direct the trash passing through said wide-spaced grid bars onto the reclamation saw.

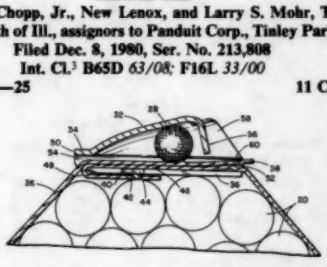
4,399,592
METAL TIE

Joseph A. Chopp, Jr., New Lenox, and Larry S. Mohr, Tinley Park, both of Ill., assignors to Panduit Corp., Tinley Park, Ill.

Filed Dec. 8, 1980, Ser. No. 213,808

Int. Cl.³ B65D *63/08;* **F16L** *33/00*

U.S. Cl. 24—25 **11 Claims**



1. A tie for forming a plurality of objects into a bundle and for holding a pair of objects together, said tie comprising:

at least one elongate metallic strap;

a metallic locking head disposed adjacent one end of a strap for receiving another end of a strap, said head comprising a strap entry face, a strap exit face and a strap-receiving aperture extending between said faces, said head further comprising a floor and a roof which diverge in the direction of said exit face; and

metallic roller means for lockingly engaging a strap, said head comprising retention means disposed adjacent said exit face for captively holding said roller means within said head, said roller means being movable between a threading position wherein the roller means is disposed adjacent said exit face and engages said retention means

and a locking position wherein said roller means is closer said entry face, said tie further comprising strap deflection means functioning along with said roller means in its threading position to effect a bend in the portion of a strap threaded into said head whereby said portion is maintained in engagement with said roller means without regard to the orientation of said head.

4,399,593

HOSE CLAMP WITH WEDGED LOCK

Joan De Bradandere, 245 rue de Roubaix, 7700 Mouscron, and Freddy VanMeenen, 91 rue des Deportes, 7701 Mouscron, both of Belgium

Filed Jul. 23, 1981, Ser. No. 286,171
Claims priority, application France, May 5, 1981, 81 09282
Int. Cl.³ B65D *63/08*; F16L *33/00*
U.S. Cl. 24—25 **11 Claims**

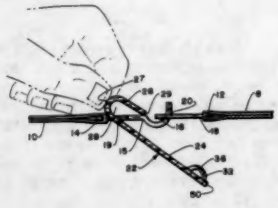
1. A non-reusable hose clamp comprising a metal band forming a loop and having first and second end portions, a casing in the form of an inverted U with a rectangular wall portion intermediate two trapezoidal side portions secured at their free edges to opposite side edges of said first end portion of said band with said wall portion disposed at an acute angle to the band, a wedge fitting in said casing, said wedge being of U-shaped cross section with a rectangular wall portion intermediate two triangular side portions, the angle of said side portions of said wedge being substantially the same as that of said side portions of said casing, and a spring attached to and connecting said wedge and said casing and urging said wedge inwardly in said casing, said second end portion of said band passing between said wedge and said first end portion of the band and being clamped by said wedge against said first end portion of said band.

4,399,594

STRAP LOCK DEVICE

Albert E. Ostermaier, Sherman Oaks, Calif., assignor to Flomar Enterprises, Burbank, Calif.

Filed Aug. 3, 1981, Ser. No. 289,337
Int. Cl.³ A44B *19/00*
U.S. Cl. 24—201 A **5 Claims**



1. A strap lock for a strap buckle, said buckle having a T-shaped coupling and a curved U-shaped coupling, each having a slot for connection to separate straps attached to a horse blanket, said strap lock being insertable into one of said buckle slots for preventing uncoupling of the buckle when the blanket is in place on an animal and the T-shaped coupling and U-shaped coupling are engaged, said strap lock comprising:

a flat rectangular plate having one end folded back upon itself and forming a flange, a base, and a bight between said flange and said base;

when said strap lock is in a locked position said base is lying below the slot of the T-shaped coupling for preventing it from twisting, said bight is holding the engaged U-shaped and T-shaped couplings and prevents the engaged couplings from twisting and becoming uncoupled;

stop means on said base for inhibiting the disengagement of said base through the slot of the U-shaped coupling;

4,399,595

MAGNETIC CLOSURE MECHANISM

John P. Yoon, and Jason J. Yoon, both of 5203 Leesburg Pike, Ste. 1304, Falls Church, Va. 22041

Filed Feb. 11, 1981, Ser. No. 233,542
Int. Cl.³ A44B *17/00*
U.S. Cl. 24—201 B **6 Claims**

1. A magnetic closure mechanism comprising:

a first strip of flexible, non-magnetic material having;

a longitudinally extending recess, said recess being rectangular in plan view, and having a flat bottom, and a series of upwardly extend tabs along an outer edge of the strip, and

a first set of magnets embedded beneath said recess within said first strip, said magnets being alternately oriented so that faces are adjacent having the opposite polarity;

a second strip of flexible, non-magnetic material having;

a longitudinally extending protrusion, said protrusion being rectangular in plan view and having a flat inner portion, and a series of recesses, said recesses being sized, shaped, and spaced to receive said tabs on said first strip whereby said strips are mechanically joined together against forces acting away from the strips, and

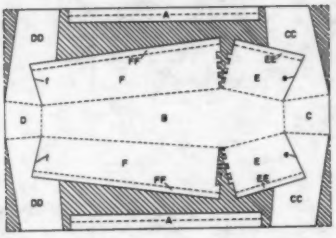
a second set of magnets slidably placed within said second strip, said magnets being alternately oriented so that faces having a polarity opposite to the polarity of the adjacent face of the magnets embedded in said first strip are juxtaposed when said first and second strips are in a closed position; and

means for moving said second set of magnets longitudinally within said second strip so that facing magnets have in said two strips the same polarity, thus magnetically pushing said tabs out of said recesses and releasing the first and second strips.

4,399,596
COFFINS

Henry W. Parlour, 42 The Woodlands, Market Harborough, and Paul A. Ginns, 2 Newbold Rd., Desford, both of Leicestershire, England

PCT No. PCT/GB81/00004, § 371 Date Nov. 2, 1981, § 102(e) Date Nov. 2, 1981, PCT Pub. No. WO81/02669, PCT Pub. Date Oct. 1, 1981
PCT Filed Jan. 13, 1981, Ser. No. 320,969
Int. Cl.³ A61G 17/00
U.S. Cl. 27—4 10 Claims



1. A coffin erected from a blank cut from a single sheet of a material selected from the group consisting of cardboard, fibre board, straw-type building board or hard board, the blank comprising a base for forming the coffin floor, side pieces for forming the coffin sides, and end pieces for forming the coffin ends, the base, said pieces and end pieces being integral yet separated by crease lines for folded erection of the coffin, the end pieces each having a pair of lateral extensions which project laterally outwardly from the end pieces on opposite sides thereof for connecting the side and end pieces in the erected coffin by being joined along their side edges, the lateral extensions being folded inwardly of the side pieces, and means for connecting the lateral extensions to respective ones of the side pieces in overlying relation, whereby the extensions support the adjacent side pieces.

4,399,597
METHOD AND APPARATUS FOR PRODUCTION OF TEXTURED YARN

Horace B. Rogers, Jr., Candler, N.C., assignor to Akzona, Incorporated, Asheville, N.C.

Filed Nov. 19, 1980, Ser. No. 208,249
Int. Cl.³ D02G 1/12, 1/16
U.S. Cl. 28—250 9 Claims

1. An apparatus for texturizing yarn, the apparatus comprising:

a bulking chamber having a smooth wall portion adjacent a yarn inlet end thereof and a gas permeable wall portion adjacent said smooth wall portion, said smooth wall portion having a length sufficient to ensure a formation of a compacted yarn mass therein,

means for producing and supplying a heated gas stream to the bulking chamber,

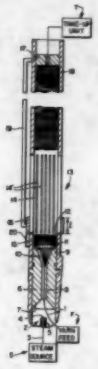
means for introducing the yarn into the heated gas stream,

means arranged at the yarn inlet end of said bulking chamber for causing yarn filaments of the yarn in the heated gas stream to splay outwardly and cause contact of the yarn filaments with said smooth wall portion thereby forming the compacted yarn mass, and

means for controlling a length of the compacted yarn mass so as to permit a constant speed take-up of the processed yarn including sleeve means displaceably mounted at the bulking chamber for covering a predetermined axial length of the gas permeable wall portion of the bulking chamber, and means for displacing the sleeve means in an axial direction of the bulking chamber upon the compacted yarn mass forming a yarn plug of a predetermined length.

9. A method for texturizing yarn, the method comprising the steps of: feeding a yarn in a gas stream to a bulking chamber having a smooth wall portion and a gas permeable wall portion,

splaying yarn filaments outwardly in the bulking chamber to contact the smooth wall portion so as to form a compacted yarn mass in the smooth wall portion of the bulking chamber, and controlling a length of the compacted

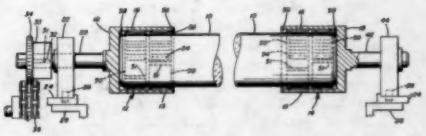


yarn mass so as to permit a constant speed take-up of the processed yarn by covering a predetermined axial length of the gas permeable portion of the bulking chamber with a cover means until the compacted yarn is displaced a predetermined distance through the bulking chamber, and automatically displacing the cover means in an axial direction of the bulking chamber to uncover the predetermined axial length of the gas permeable portion of the bulking chamber in response to the compacted yarn means being displaced through said predetermined distance.

4,399,598
CERAMIC ROLLS WITH METAL END CAPS

Joseph V. Page, Oakdale, and Henry P. Hanneken, Pittsburgh, both of Pa., assignors to PPG Industries, Inc., Pittsburgh, Pa.

Filed Apr. 6, 1981, Ser. No. 241,429
Int. Cl.³ B21B 31/00
U.S. Cl. 29—115 10 Claims



1. For use with heated furnaces, a glass sheet conveyor roll of fused silica composition having an axially elongated, substantially cylindrical shape including an intermediate portion of round cross-section for conveying glass sheets for thermal treatment, shafts located in alignment with the ends of said roll, and means for drivingly connecting at least one of said shafts to said roll, said means comprising a metal end cap having a cylindrical inner surface rotatable with one of said shafts, said inner surface having a diameter slightly larger than the diameter of said roll at the corresponding end of said roll, and wedging means interposed between said inner surface and said roll comprising a split, circumferentially expandable and radially compressible metal ring having axially extending corrugations,

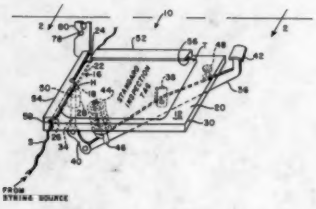
the unstressed radial height of said ring being slightly greater than the difference in radius between the end portion of said roll and the inner surface of said metal end cap when said ring is unstressed, said ring being interposed between said inner cylindrical surface of said metal end cap and the corresponding end portion of said roll to compress said corrugations radially and provide a tight coupling between said inner cylindrical surface of said metal end cap and the outer surface of said corresponding end portion of said roll.

4,399,599

TAG THREADER APPARATUS

Lenard R. Howe, 644 W. 400 South, Centerville, Utah 84014

Filed Jul. 7, 1981, Ser. No. 281,139
Int. Cl.³ B23P 19/04
U.S. Cl. 29—241 8 Claims



1. Tag threader apparatus, comprising:

a. a flat base having opposite first and second sides;

b. a string guiding groove defined in said base across one end and below the lever of said first side thereof for receiving a strand of string and having a central portion which opens at said first side of said base, said groove being dimensioned to confine the strand of string to a path along which the strand will always extend across said central portion of said groove;

c. a plunger guide attached to said second side of said base opposite said first side thereof and having an opening which intersects with said central portion of said string guiding groove and the strand of string confined therein;

d. a plunger movably mounted within said plunger guide such that a free end of said plunger is extendible through and retractible from said opening of said guide and said central portion of said groove for contact with the strand of string and movement above and below said first side of said base with sufficient clearance being present between said free end of said plunger and said central portion of said groove to allow passage of a portion of the strand of string with said plunger free end through said central portion of said groove and above said first side of said base without severing the strand of string;

e. means biasing said plunger toward a first position in which said free end thereof is retracted below said first side of said base for allowing a tag to be positioned on said first side with a leading edge of said tag overlying said groove in said base and a hole in the leading edge of said tag aligned with said central portion of said groove; and

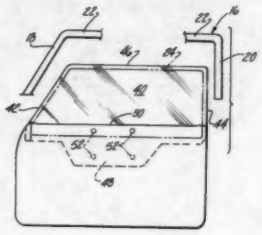
f. a lever pivotally mounted on said second side of said base and pivotally connected to said plunger, said lever being actuatable so as to move said plunger against said biasing means to a second position in which said free end of said plunger and the portion of the strand of string therewith extend above said first side of said base and through the hole of the tag, threading therethrough the portion of the strand of string from said string guiding groove.

4,399,600

VEHICLE DOOR CONVERSION

David L. Draper, Hamburg, and Gerald D. McKee, Highland, both of Mich., assignors to Cars and Concepts, Inc., Brighton, Mich.

Filed Jul. 10, 1981, Ser. No. 282,043
Int. Cl.³ B22D 19/10
U.S. Cl. 29—401.1 8 Claims



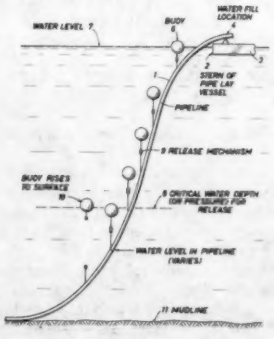
1. The method of converting a sedan body having doors with framed and sliding windows to a vehicle body having doors with unframed windows comprising the steps of: cutting the door frame at opposite sides of the window opening, removing the frame, removing the glass window panel through the upper end of the door, installing a new glass window panel having a larger perimeter than the original glass window panel, and installing a seal assembly to the edge of the door opening to engage the new window panel when the door is in a closed position.

4,399,601

METHOD OF PREPARING AND USING A PRESSURE ACTUATED RELEASE MECHANISM

Ray R. Ayers, Houston, Tex., assignor to Shell Oil Company, Houston, Tex.

Continuation of Ser. No. 135,835, Mar. 31, 1980, abandoned.
This application Jul. 26, 1982, Ser. No. 402,172
Int. Cl.³ B23P 17/00; F16L 1/04
U.S. Cl. 29—407 4 Claims



1. A method for preparing and using an actuating means susceptible to substantially collapsing at a preselected fluid pressure, comprising:

mechanically denting an outer surface of a closed vessel;

propagating the dent with fluid pressure outside the closed vessel to reduce the cross-sectional area of at least part of the closed vessel without substantially collapsing the closed vessel, thereby forming the actuating means;

observing the pressure necessary to propagate the dent; and

disposing the actuating means in an environment wherein

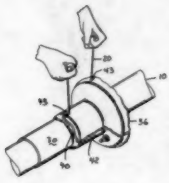
the pressure necessary to propagate the dent is a critical pressure which will substantially collapse the actuating means.

4,399,602

CABLE END CAP REMOVAL METHOD

David S. Hancock, Roswell, and James R. Holman, Lilburn, both of Ga., assignors to Western Electric Company, Inc., New York, N.Y.

Filed Jul. 28, 1981, Ser. No. 287,619
Int. Cl.³ B23P *19/00*
U.S. Cl. 29—426.4 **5 Claims**



1. A method of removing an end cap from a telecommunications cable of the type wherein the end cap has a closed end portion encasing a bundle of connectors affixed to wire ends of the cable and being sealed to the cable jacket by a tubular seal overlaying an open end portion of the end cap through which the cable extends from the connector bundle, and with the method comprising the steps of:

(a) severing the end cap closed end from the open end and removing the closed end from about the cable bundle;

(b) forming a hole in the tubular seal closely adjacent the end cap open end;

(c) inserting a wire through the tubular seal hole and between the cable jacket and end cap open end;

(d) forming a circumferential incision with the wire in the tubular seal;

(e) forming a plurality of circumferentially spaced longitudinal incisions with the wire in the end cap open end extending from the circumferential incision in the seal thereby segmenting the end cap open end into a plurality of circumferential segments; and

(f) removing the end cap open end segments from about the cable.

4,399,603

POWER GRIP TOOL EXCHANGE ARM FOR MACHINING CENTER

Robert E. Reed, Kaukauna, Wis., assignor to Giddings & Lewis, Inc., Fond du Lac, Wis.

Filed Nov. 17, 1980, Ser. No. 207,664
Int. Cl.³ B23Q *3/157*
U.S. Cl. 29—568 **14 Claims**

1. In a machining center which includes a headstock, a power spindle, and an automatic tool changer, the combination comprising:

(a) a tool exchange arm;

(b) a support shaft fixed to said exchange arm and extending normally thereof, said shaft being mounted in said headstock for rotational and axial movement relative thereto;

(c) power means for rotating said arm in planes normal to the axis of said shaft;

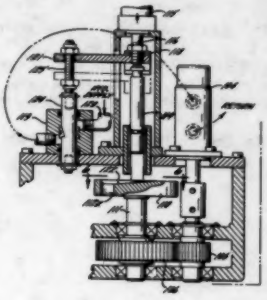
(d) a locating disc driven in timed relation with said power means and journaled on an axis laterally offset from that of said tool exchange arm;

(e) means defining a pair of positioning sockets in said locating disc corresponding respectively to two spaced apart rotational positions of said arm;

(f) a shot pin slidably mounted in said headstock and adapted to engage an alined one of said positioning sockets;

(g) deceleration valve means connected with said power means and adapted to decelerate said exchange arm as a disc positioning socket approaches alinement with said shot pin; and

(h) means connecting said shot pin with said deceleration valve means for actuation of the latter by said shot pin;



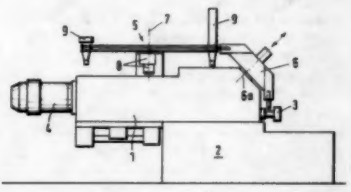
(i) means on said locating disc engageable by said shot pin for actuating said deceleration valve means as a disc positioning socket approaches alinement with said shot pin.

4,399,604

DISK MAGAZINE FOR USE AS TOOL HOLDER FOR A UNIVERSAL DRILLING AND MILLING MACHINE

Willi Krug, Gudensberg, Fed. Rep. of Germany, assignor to Maho Werkzeugmaschinenbau Babel & Co., Fed. Rep. of Germany

Filed Dec. 17, 1981, Ser. No. 331,674
Claims priority, application Fed. Rep. of Germany, Dec. 30, 1980, 3049423
Int. Cl.³ B23Q *3/157*
U.S. Cl. 29—568 **5 Claims**



1. A disk magazine useful as tool holder for universal drilling and milling machines, comprising a disk horizontally mounted on the machine through the headstock, a plurality of tongs-like tool holders provided at the outer periphery of the disk at a fixed spacing, and an actuating motor which through a Geneva drive rotates the disk magazine about its axis of rotation in steps determined by the spacing of the tool holders, wherein the disk of the disk magazine is composed of two flat plates connected together at a fixed spacing therebetween and having at their circular outer circumference tongs-like recesses serving as common tool holders, said plates being non-rotatably connected to the central bearing, and wherein one of said plates is the annular disk which at its inner edge is formed alternately with radial slots and with semicircular recesses of the Geneva drive, and wherein the drive shaft of the actuating motor is coupled to the drive gear of the Geneva drive, the eccentrically disposed drive pin of said Geneva drive being associated with the radial slots in said annular disk, and the locking and guiding portion of said Geneva drive, which portion is in the form of an annular segment, being associated with the semicircular recesses in the annular disk,

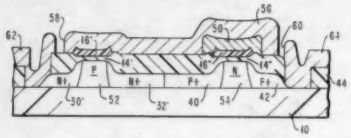
characterized in
that a rocker arm (36) is pivotally mounted to the drive pin (34), said radial outer end portion (37) of said rocker arm (36) alternately entering the radial slots (33) in the annular disk (10).

4,399,605

METHOD OF MAKING DENSE COMPLEMENTARY TRANSISTORS

Somanath Dash; Richard R. Garnache, both of South Burlington, and Ronald R. Troutman, Essex Junction, all of Vt., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Feb. 26, 1982, Ser. No. 352,990
Int. Cl.³ H01L *21/265, 21/28*
U.S. Cl. 29—571 **23 Claims**



1. A method of making complementary field effect transistors in a semiconductor layer having a first portion including an N type transistor having a channel region defined by N type source and drain regions and having a second portion including a P type transistor having a channel region defined by P type source and drain regions, with an insulating layer disposed over said first and second portions, the method comprising the steps of:
applying a masking layer over said insulating layer having an opening disposed over one of said portions,
introducing a first impurity into the channel region of said one portion to adjust the impurity therein,
depositing a first conductive material on said insulating layer over the channel region of said one portion,
removing said masking layer,
introducing a second impurity into the channel region of the other of said first and second portions to adjust the impurity therein, and
depositing a second conductive material on said insulating layer over the channel region of said other portion and in contact with said first conductive material, said second conductive material having a different work function than that of said first conductive material.

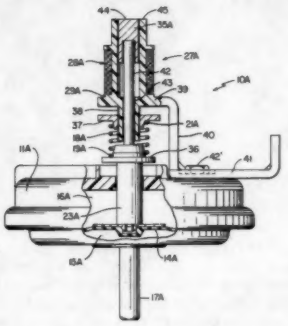
4,399,606

METHOD OF MAKING A RESPONSIVE CONTROL DEVICE

Thomas M. Buckshaw, Indiana, Pa., assignor to Robertshaw Controls Company, Richmond, Va.

Division of Ser. No. 122,446, Feb. 19, 1980, Pat. No. 4,300,396. This application Aug. 21, 1981, Ser. No. 295,213
Int. Cl.³ H01F *7/06*
U.S. Cl. 29—602 R **11 Claims**

1. In a method of making a pressure responsive control device having a housing means carrying a flexible diaphragm means therein that cooperates with said housing means to define a pressure chamber therein that is adapted to receive a variable pressure that acts against said diaphragm means to position the same relative to said housing means in relation to the value of said pressure, said diaphragm means being operatively interconnected to a plunger means that follows the movement of said diaphragm means, said control device having transducer means operatively associated with said plunger means to produce an electrical signal in relation to the position of said plunger means, a core means being carried by said plunger means in axially aligned relation therewith, an induction coil means carried by said control device and receiving said core means therein whereby said core means and said induction coil means comprise said transducer means, a range spring being carried by said housing means and being operatively interconnected to said diaphragm means to tend to oppose movement of said diaphragm means in one direction of movement thereof, calibration means to calibrate said range spring, said calibrating means comprising a movable calibrating member carried by said housing means, said range spring comprising a coiled compression spring having opposed ends, one of said ends of said coiled compression spring bearing against said calibrating member and the other of said ends



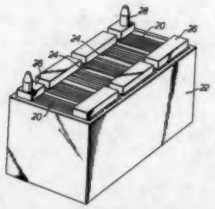
bearing against said plunger to be operatively interconnected to said diaphragm means, said plunger having an annular shoulder thereon, said other end of said coiled compression spring bearing against said annular shoulder, said coil means comprising a spool-like member having an electrical coil disposed thereon, a bracket member being secured to said housing means and carrying said spool-like member, the improvement comprising the steps of forming said spool-like member to have an externally threaded portion, and threading said calibrating member to said threaded portion to provide for calibrating movement thereof.

4,399,607

METHOD AND APPARATUS FOR MAKING RECOMBINANT STORAGE BATTERIES HAVING COATED INTERCELL CONNECTORS

Geoffrey J. May, Warrington, England, assignor to Chloride Group Limited, London, England

Filed Sep. 29, 1981, Ser. No. 306,672
Claims priority, application United Kingdom, Oct. 8, 1980, 8032506
Int. Cl.³ H01M *2/32*
U.S. Cl. 29—623.5 **13 Claims**



1. A method of manufacturing an electric storage battery including the steps of placing a plurality of cell packs into a battery container, said cell packs comprising alternate positive and negative plates interleaved with fibrous absorbent separator material, each of said positive and negative plates having a

projecting plate lug, transferring said container to a moulding station and forming plate straps and intercell connectors around said plate lugs in a plurality of mould cavities, transferring said container to a coating station and dipping said intercell connectors whilst still hot into a fluidised bed of organic polymer particles which adhere to said intercell connectors to form an impervious layer around them.

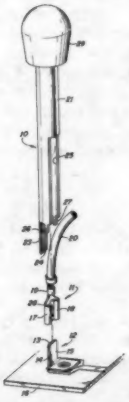
7. Apparatus for manufacturing an electric storage battery including holding means for holding a battery container whilst containing two or more cell packs, said cell packs comprising alternate positive and negative plates interleaved with separator material and said plates each having a projecting plate lug, and transfer means for moving said container successively to a moulding station and then to a coating station, a moulding station including a plurality of mould cavities for forming platestraps and intercell connectors around said plate lugs, a coating station comprising a fluidised bed in which, in use, organic polymer particles are fluidised and means to cause relative movement between said battery container and said fluidised bed to dip said intercell connectors into said fluidised bed whilst they are still hot to coat them with an impervious layer of said organic polymer.

4,399,608

SPADE LUG RECEPTACLE FITTING TOOL

Michael L. Ingaglio, Randolph, N.J., assignor to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed Dec. 23, 1981, Ser. No. 333,638
Int. Cl.³ H01R *43/00*
U.S. Cl. 29—747 **4 Claims**



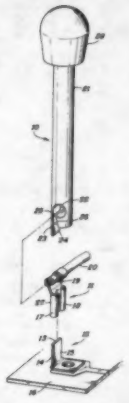
1. A tool for fitting a conductor receptacle to a spade lug terminal, said receptacle having a pair of folded over sides for receiving the sides of said terminal, each folded over side defining in part an axially extending recess, and a conductor contact section folded about said conductor, the end of said conductor extending substantially parallel to said folded over sides, said tool comprising a rod having a hole formed therein from one end coaxial with its longitudinal axis, said hole receiving the folded conductor contact section of said receptacle, said one end of said rod further having a slot formed therein to said hole parallel to said longitudinal axis, said slot admitting said conductor, a tab extending beyond said one end of said rod having a surface substantially tangent to the inner surface of said hole, said tab bearing on one side of said receptacle when said folded conductor contact section of said receptacle is fitted into said hole, and a pair of lugs extending beyond said one end of said rod on respective opposite sides of said slot, said lugs fitting within respective ones of the axially extending recesses of said folded over sides, of said receptacle when said folded conductor contact section of said receptacle is fitted into said hole.

4,399,609

SPADE LUG RECEPTACLE FITTING TOOL

Michael L. Ingaglio, Randolph, N.J., assignor to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed Dec. 23, 1981, Ser. No. 333,763
Int. Cl.³ H01R *43/00*
U.S. Cl. 29—747 **3 Claims**



1. A tool for fitting a conductor receptacle to a spade lug terminal, said receptacle having a pair of folded over sides for receiving the sides of said terminal and a conductor contact section folded about said conductor at substantially right angles to said folded over sides, said tool comprising a rod having a bore formed therein at one end substantially transverse to its longitudinal axis dimensioned to receive the folded conductor contact section of said receptacle, said one end of said rod further having a slot formed therein to said bore, said slot having walls substantially parallel to the central axis of said bore, and a tab extending beyond said one end of said rod, said tab having a surface comprising one wall of said slot substantially tangent to the inner surface of said bore, the other wall of said slot and the end of said rod being dimensioned to bear against one side of said conductor contact section and the ends of said folded over sides, respectively, of said receptacle and said tab being dimensioned to bear on the other side of said receptacle when said folded conductor contact section of said receptacle is fitted into said bore.

4,399,610

ASSEMBLING AN ELECTRONIC DEVICE

Harold W. Moyer, Allentown, Pa., assignor to Western Electric Company, Inc., New York, N.Y.

Filed Apr. 1, 1981, Ser. No. 249,752
Int. Cl.³ H01R *43/00*; B23P *23/00*
U.S. Cl. 29—827 **10 Claims**

1. A method of assembling an electronic device attached to a sheet via a plurality of leads, comprising:

detaching from the sheet the device including the leads attached to the device and at least one sheet member interconnecting such leads for maintaining desired spacings therebetween during lead forming;

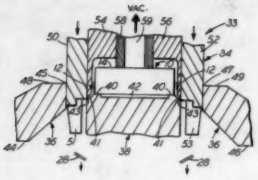
forming the leads into a given configuration whereby said at least one interconnecting member detached from said sheet continues to maintain the desired spacing between the leads; and then

trimming the at least one interconnecting member from the leads to electrically isolate said leads from each other

without substantially disturbing the desired spacings therebetween.

6. Apparatus for assembling an electronic device attached to a sheet via a plurality of leads, comprising:

means for detaching from the sheet the device including the leads attached to the device and at least one sheet member interconnecting such leads for maintaining desired spacings therebetween during lead forming;



means for forming the leads into a given configuration, said at least one interconnecting member maintaining desired spacings between such leads during the operation of the forming means; and

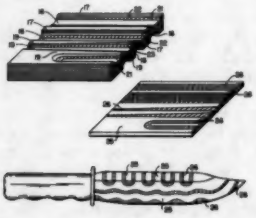
means operable after the operation of the forming means for trimming the at least one interconnecting member from the leads to electrically isolate said leads from each other without disturbing the desired spacings therebetween.

4,399,611

ARTICLE OF DECORATIVE METAL MANUFACTURE

Thomas E. Maringer, 2306 S. Powell St., Springdale, Ark. 72764

Filed Nov. 10, 1980, Ser. No. 205,426
Int. Cl.³ B26B *9/00*
U.S. Cl. 30—350 **11 Claims**



1. A method of manufacturing a decorative metal article of cutlery having a cutting blade of exceptional alloyed strength comprising:

a. assembling between surface layers a laminated structure of alternating internal layers of steel and brazing alloy in the form of a foil of uniform thickness, the brazing alloy having a composition comprising nickel and at least one of the group consisting of chromium, boron, silicon and iron;

b. heating the structure throughout while the layers are in intimate contact to about 2000° F., a temperature higher than the melting temperature of the brazing alloy, for at least about one half hour;

c. removing portions of at least one surface layer of the structure to a depth which penetrates at the least one brazing alloy layer, leaving elevated portions adjacent to depressed portions;

d. subjecting the structure to working operations which compress the elevated portions to the level of the depressed portions, and shape the structure into a cutlery blade;

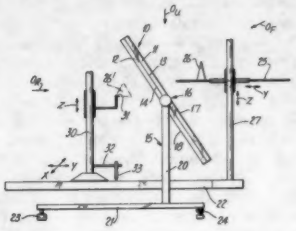
e. and polishing the blade to produce a surface of variegated decorative appearance.

4,399,612

MEASURING INSTRUMENT

Peter J. Scott, 9 Whitehall Park, London, England N19 3TS

Filed Jun. 24, 1981, Ser. No. 276,798
Int. Cl.³ B43L *13/16*
U.S. Cl. 33—20 R **24 Claims**



1. A measuring instrument, comprising:

a plotting table;

a part-reflecting mirror device having two parallel sheets of transparent material with the same optical properties and the same thickness, an image reflected by at least one of the adjacent surfaces of the sheets being substantially stronger than any images reflected by the remaining surfaces of the sheets;

a measuring mark which may be moved in all directions of a three dimensional coordinate axis system, (X, Y, Z) into coincidence with an image, produced by the mirror, device of an object to be plotted;

an object table which is disposed on one side of the mirror device and which is adapted to support the object;

a plotting stand mounted on and movable over the plotting table, which is disposed on the opposite side of the mirror device and on which is disposed the measuring mark; and,

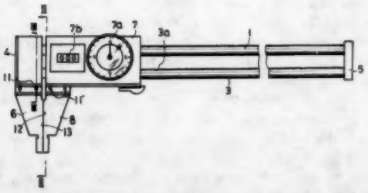
means operable in conjunction with the measuring mark for producing a measured plot of the object.

4,399,613

TWO-LEG VERNIER CALIPERS AND ITS MANUFACTURING METHOD

Goro Nishikata, and Kozo Shibukawa, both of Kawasaki, Japan, assignors to Kabushiki Kaisha Mitutoyo Seisakusho, Tokyo, Japan

Continuation of Ser. No. 198,062, Oct. 17, 1980, abandoned.
This application Mar. 8, 1982, Ser. No. 356,032
Claims priority, application Japan, Oct. 23, 1979, 54-136842
Int. Cl.³ G01B *5/02*
U.S. Cl. 33—143 M **3 Claims**



1. A method of manufacturing vernier calipers wherein the vernier calipers have two parallel legs with a space therebetween, which legs slidably support a vernier thereon that carries one jaw of a pair of opposed measuring jaws, the other jaw being fixed on the parallel legs by a stop, the method comprising the steps of:

sliding a bushing over each leg;

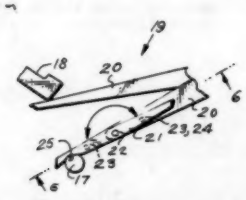
fabricating a vernier which is U-shaped in cross-section to define a longitudinally extending slot therein;
sliding the vernier over each bushing and bonding the vernier to the bushings with the bushings laterally spaced from one another and with the slot extending past the bushings to define a groove wherein the vernier and bushings form a unit which slides longitudinally on the parallel legs with the groove opening laterally thereof;
bonding the parallel legs at one end to a first stop;
fabricating a second stop having bores for receiving the parallel legs and a longitudinally extending groove;
bonding the parallel legs in the bores of the second stop while the stop is positioned with the groove opening in the same direction as the groove defined by the slot of the vernier;
fabricating the jaws as separate first and second pieces each jaw having a planar measuring surface and a positioning surface extending generally orthogonally to the measuring surface;
inserting the positioning end of the first jaw into one of the slots and positioning the jaw so that the measuring surface extends at a right angle to the pair of parallel legs;
bonding the inserted first jaw within the slot;
drilling a pair of longitudinally spaced holes through the walls of the slot and the first jaw;
inserting securing pins within the holes;
inserting the positioning end of the second jaw within the other slot with the measuring surface in abutment with and parallel to the measuring surface of the first jaw;
bonding the second jaw within the other slot;
drilling a pair of longitudinally spaced holes through the walls of the other slot and through the second jaw, and
inserting securing pins within the holes to reinforce the joint between the second jaw and the other slot whereby the measuring surface of the second jaw is both parallel to the first jaw and perpendicular to the pair of parallel legs.

4,399,614

HORSESHOE MEASURING DEVICE

Charles W. Kertz, 1310 Hwy. M, Barnhart, Mo. 63012, assignor to Charles W. Kertz, Barnhart, Mo.

Filed Apr. 23, 1981, Ser. No. 256,957
Int. Cl.³ G01B 3/16
U.S. Cl. 33—149 R **1 Claim**



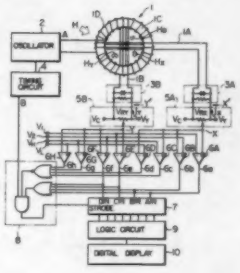
1. A horseshoe measuring device, comprising, in combination, a base member, for being used as a straight edge in measuring the distance of the legs of a horseshoe from an anchored horseshoe peg, caliper means secured to said base, for measuring the distance between a pair of said horseshoes from said peg; said caliper means comprising a pair of tapered arms, secured pivotally at their one ends on a common pivot pin near one end of said base member, a first of said arms being pointed at its opposite end, and said pivot pin also pivotally retaining a file member by one of its opposite ends; the faces of said file member being used to remove burrs that occur on horseshoes, and the opposite end of said file member includes a scraper tip, for removing mud, and being also used for digging purposes; and a second of said caliper arms having an extension arm pivotally attached, at substantially its midpoint, to an end of said second caliper arm, said extension arm being pointed at one end and the other end having a recess formed in a side edge thereof, and cooperating detent means, adjacent said pivotal attachment, on said extension arm and the end of the second caliper arm for locking said extension arm in position so that one end or the other may be positioned for use with the pointed end of the first caliper arm.

4,399,615

DIRECTION INDICATOR

Muneaki Matsumoto, Okazaki; Akira Kuno, Oobu, and Koji Numata, Toyokawa, all of Japan, assignors to Nippon Soken, Inc., Nishio, Japan

Filed May 20, 1981, Ser. No. 265,688
Claims priority, application Japan, May 23, 1980, 55-71553[U]
Int. Cl.³ G01C 17/28
U.S. Cl. 33—361 **3 Claims**



1. A direction indicator comprising a direction sensor including a core, an exciting coil wound on said core set in earth magnetic field and two output coils wound on said core to cross at right angles with respect to each other to surround opposing portions of said core, means for specifying a particular direction on the basis of signals obtained from said two output coils of said direction sensor, and means for setting up direct current magnetic fields cancelling the residual magnetism in said direction sensor by supplying direct currents of given intensities to said two output coils and making equal the maximum values of the output signals of said two output coils by adjusting the gain of these output signals.

4,399,616

TELESCOPING MEASURING RULE

Elis Jansson, Ludvika, Sweden, assignor to Olle Humble, Lidingo, Sweden

Filed Oct. 6, 1981, Ser. No. 309,118
Claims priority, application Sweden, Oct. 17, 1980, 8007306
Int. Cl.³ G01B 3/08
U.S. Cl. 33—161 **6 Claims**

1. In a telescoping measuring rule, comprising a plurality of slidably interconnected staff-shaped sections, which can be displaced relative to each other in their longitudinal directions to vary the length of the measuring rule, and abutments to determine the maximum relative displacement in one direction between interconnected sections; the improvement in which said sections have a first scale for taking outside measurements, the graduation thereof beginning at the outer end of an end section, the graduation of the other sections being a continuation of the graduation of the immediately preceding sections,

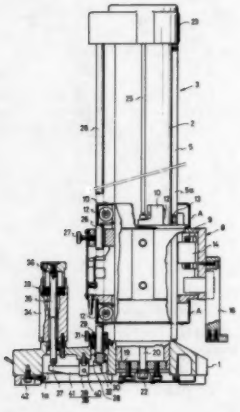
and a second scale for taking inside measurements, the graduation of which begins at the outer end of an end section with a lowest value equal to the length of the measuring rule when fully contracted, the graduation of the other sections being a continuation of the graduation of the immediately preceding sections, said second scale being placed so that the measurement can be read against the end edge of the next following section.

4,399,617

HEIGHT GAGE

Susumu Yoshioka, Utsunomiya, Japan, assignor to Mitutoyo Mfg. Co., Ltd., Tokyo, Japan

Filed Oct. 13, 1981, Ser. No. 310,680
Claims priority, application Japan, Oct. 24, 1980, 55-151953[U]
Int. Cl.³ G01B *7/00*
U.S. Cl. 33—169 R **9 Claims**



1. A height gage comprising: a base; a hollow cylindrical column upwardly erected on said base; a vertically extended scale secured to the outer surface of said column and provided thereon with graduations of μm order; a slider slidably coupled to said column and having a detector opposed to and in non-contact with said scale; means for preventing the rotation of said slider in the circumferential direction of said column as referenced from said scale; a balance weight connected to said slider and slidably inserted into said column; a fine adjusting rod disposed parallel to said column and vertically fixable and releasable with respect to said slider, said fine adjusting rod being vertically movably mounted with respect to said column; and a fine adjusting screw mechanism adapted to finely move said fine adjusting rod, said fine adjusting screw mechanism projecting upwardly from said base for engagement to horizontally move said gage as a whole.

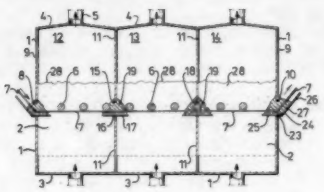
4,399,618

METHOD OF SEALING A FLUIDIZED BED AND DEVICE FOR CARRYING OUT THE METHOD

Hans Rydstad, Bollstrasse 638, CH-5413 Birmenstorf, Switzerland

PCT No. PCT/SE81/00034, § 371 Date Sep. 28, 1981, § 102(e) Date Sep. 28, 1981, PCT Pub. No. WO81/02258, PCT Pub. Date Aug. 20, 1981
PCT Filed Feb. 3, 1981, Ser. No. 306,918
Claims priority, application Sweden, Feb. 7, 1980, 8000996
Int. Cl.³ F26B *3/08*
U.S. Cl. 34—10 **5 Claims**

1. A method of sealing an opening between two zones in a fluidized bed container and/or between the bed and its surrounding, in which bed particles are intended to be maintained suspended by means of a carrier gas, which is introduced in the bed bottom below the level of said opening, the primary purpose of the opening being to enable passage therethrough of workpieces intended to be treated in the bed, and which opening is, for example, a horizontal gap in a vertical partition wall between the zones or in a wall of the fluidized bed container between the bed and its surrounding, characterized in that by utilizing the movements of the particles and carrier gas in the bed and means at the opening at least a heap of particles is caused to be built up at the said opening to such a height, that



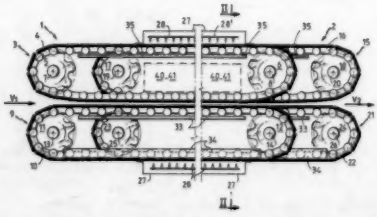
the opening is effectively closed and sealed against passage of the carrier gas therethrough by the heap of particles, workpieces being subjected to treatment in the fluidized bed container are passed through the opening and thereupon through the sealing heap of particles, causing disruption and at least partial demolishing of the built up heap of particles at the opening, and after the workpiece has passed through the opening the heap of particles is rebuilt by the movements of the carrier gas and the particles of the fluidized bed to again effectively close and seal the opening against passage of carrier gas therethrough.

4,399,619

MACHINE FOR DRYING AND BUTT-JOINTING WOOD VENEER BY CONTINUOUS CONTACT ENGAGEMENT

Jean-Marie M. Martin, 23, rue de Turin, 75008 Paris (Seine), France

Filed May 13, 1981, Ser. No. 263,399
Claims priority, application France, May 20, 1980, 80 11269
Int. Cl.³ F26B *13/12*
U.S. Cl. 34—148 **13 Claims**



1. In a machine for drying and butt-jointing unwound or sectioned wood veneer by continuous contact engagement, comprising an effective drying and jointing zone defined therein, said machine including

an input conveyor and an output conveyor which are driven independently, each of said conveyors including an upper set and a lower set forming pairs of endless chains with pallets,

said chains each having an active run and a return run, sprockets for simultaneously driving said chains and roller means for guiding their active and return runs by running on respective supporting guide-rails, said active runs fac-

ing each other compressing the veneer therebetween and conveying it in the longitudinal direction of the machine,

means for heating said runs of said chains,

a first pressure means positioned directly over the pairs of chains of the input conveyor in the effective zone,

a second pressure means positioned directly over the pairs of chains of the output conveyor in the effective zone,

the improvement consisting in that said first and second pressure means are positioned and extend identically over every point of the length of the whole effective drying and jointing zone of the machine,

said first and second pressure means comprise respectively as many elastically deformable longitudinal chambers as there are pairs of upper and lower endless chains in the associated conveyor,

said chambers are supplied with upper support plate constituted by a longitudinal girder, which is fastened to the machine, and a flexible and relatively heavy layer, formed by a chain of interarticulated links, fixed in the longitudinal direction of the machine, having a width corresponding to that of the associated upper chain, bearing directly on said rollers of the active run of said chain and subjected to pressure from said deformable chamber pressing against said plate.

4,399,620

PADDED SOLE HAVING ORTHOPAEDIC PROPERTIES

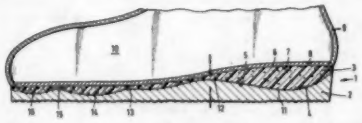
Herbert Funck, Am Wasserbogen 43, 8032 Lochham, Fed. Rep. of Germany

Filed Sep. 21, 1981, Ser. No. 303,941

Claims priority, application Fed. Rep. of Germany, Oct. 1, 1980, 3037108

Int. Cl.³ A43B *13/12, 13/04*

U.S. Cl. 36—30 R **3 Claims**



1. A padded sole having orthopaedic properties, said sole being adapted for attachment to an upper shoe comprising:

a wear-resistant lower walking sole layer made of a high-tenacity plastic material having upwardly extending side skirts enclosing an inner padded layer of a flexible material and further providing for enclosure of a permanently deformable insole and defining a bed for the direct mounting of the lower walking sole to the upper shoe;

the interface between the walking sole layer and the inner padded layer being continuously formed integrally with said walking sole layer and having a foot-orthopaedic contour in the longitudinal and in the transverse direction of the sole;

the walking sole layer exhibiting a bed-like indentation in the region of the heel bone, raised portions at the inner side of the sole in the region of the ankle and in the region of the metatarsal bone, an indentation in the region of the toe ball, and a raised portion beneath the toe bone;

the inner padded layer having a thickness varying to be respectively thicker and thinner at positions of the indentations and raised portions of the walking sole; and

the upper surface of the inner padded layer merging with the walking sole where said padded layer is enclosed by said side skirts to form a smooth surface adapted to receive the permanently deformable insole.

4,399,621

ATHLETIC SHOE, ESPECIALLY TENNIS SHOE

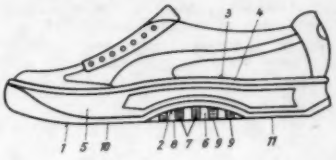
Armin A. Dassler, Herzogenaurach, Fed. Rep. of Germany, assignor to PUMA-Sportschuhfabriken Rudolf Dassler KG, Herzogenaurach, Fed. Rep. of Germany

Continuation-in-part of Ser. No. 296,785, Aug. 27, 1981. This application Sep. 29, 1981, Ser. No. 306,864

Claims priority, application Fed. Rep. of Germany, Aug. 27, 1980, 8022784[U]

Int. Cl.³ A43B *13/04*

U.S. Cl. 36—32 R **18 Claims**



1. Athletic shoe, especially a tennis shoe, with an insole forming an ankle support in the region of the plantar arch and with a tread sole having a tread and provided with a substantially corresponding recess in the region of the plantar arch, characterized in that several discrete supporting profiles of various heights are arranged in the region of the constriction of the tread sole, an eveloping line of which on free ends of these supporting profiles on the tread side lies at least approximately in the plane of adjoining tread sole parts.

4,399,622

FLUID INTAKE OPENINGS FOR A SUCTION DREDGER

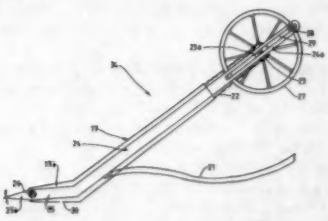
George A. Howard, 453 Waimea Rd., Nelson, New Zealand

Filed Oct. 27, 1980, Ser. No. 201,240

Claims priority, application New Zealand, Oct. 29, 1979, 191958

Int. Cl.³ E02F *3/88*

U.S. Cl. 37—57 **25 Claims**



1. In a dredging apparatus comprising a fluid intake opening located at the lower end of a housing arranged to depend from an upper support structure at or above water level, said support structure supporting a suction pump means and a conduit extending downward therefrom to said intake opening for the passage to a receiving station of fluid and solids admitted to the intake opening, wherein a filter screen member is disposed so as to extend over said fluid intake opening and to restrict the ingress of oversized extraneous material, said filter member having motion means operatively associated therewith for providing intermittent or continual movement of the filter member relative to the fluid intake opening and for clearing the apertures of the filter member during operation, the improvement comprising:

a wedge-shaped dredge foot housing both the fluid intake opening and the filter member, said intake opening being located on the underside of said dredge foot and said filter member being located above said fluid intake opening so

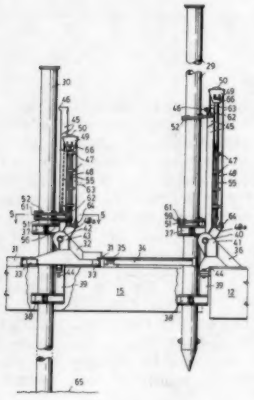
as to be placed between said intake and said conduit, the taper of said wedge being toward the forward edge of said dredge foot and the underside of said dredge foot being substantially planar.

4,399,623

DREDGES

John A. Neumann, Currumbin, Australia, assignor to Neumann Equipment Marketing Co. Pty. Ltd., Currumbin, Australia

Filed Jun. 15, 1981, Ser. No. 273,767
Claims priority, application Australia, Jun. 18, 1980, PE4080
Int. Cl.³ E02F 9/00
U.S. Cl. 37—73 **4 Claims**



1. A dredge of the type having a hull on which are mounted a first spud and a second spud each vertically slidable and adapted to be driven down into a sea bed to anchor the hull, wherein:

said first spud is vertically slidable through a spud frame on a carriage mounted on said hull and adapted to be slidably moved longitudinally relative to said hull,

said second spud is vertically slidable through a spud frame on a carrier fixed on said hull,

for each said spud there is an associated lifting means for raising said associated spud, an associated locking means for holding said associated spud in raised position, and an associated release means for releasing said associated locking means to permit said associated spud to drop and drive into the sea bed, wherein said lifting means and said locking means comprise an apertured lifting plate disposed above an aperture locking plate, each of said plates being fitted closely about said associated spud and adapted to permit free passage of said associated spud therethrough when substantially perpendicular to said associated spud but to hold said associated spud frictionally when tilted, said locking plate being fulcrumed at one side on a fulcrum on said spud frame of said associated spud so as to tilt gravitationally and to lock said associated spud against descent while permitting said associated spud to be lifted by said lifting plate, said lifting means also including means for raising and lowering said lifting plate and tilting it when raising it to cause said lifting plate to grip and lift said associated spud, and

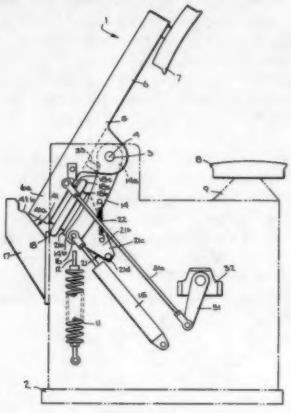
propelling means are provided for advancing said hull relative to said spud carriage when, said second spud being raised, said first spud is driven into the sea bed.

4,399,624

GARMENT PRESSING MACHINE

David B. Ward, Madison, N.J., assignor to Rheem Textile Systems, Inc., Paterson, N.J.

Filed Jun. 4, 1981, Ser. No. 270,359
Int. Cl.³ D06F 71/06
U.S. Cl. 38—27 **24 Claims**



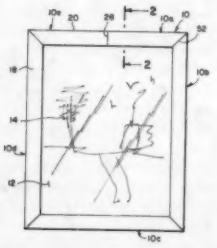
1. A pressing machine comprising: a frame; a buck supported on said frame, an arm pivotally mounted at a point on said frame with first and second arm portions forward and rearward of said pivot point, respectively; a pressing head affixed to said first arm portion; a link pivotally mounted on said frame and extending in spaced relationship to said second arm portion; an actuator means disposed between said second arm portion and said link for selectively applying an actuating force between said second arm portion and said link tending to rotate said arm relative to said link to urge said head forcefully toward said buck.

4,399,625

ROLL-ON PICTURE FRAME

Thomas R. Langan, 2801 Kennedy Blvd., E-10, Jersey City, N.J. 07306

Filed Dec. 18, 1981, Ser. No. 332,350
Int. Cl.³ G09F 1/12
U.S. Cl. 40—155 **4 Claims**



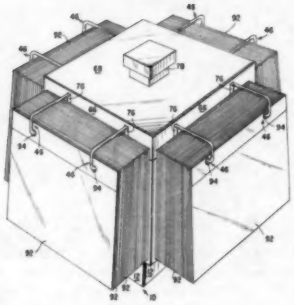
1. A roll-on picture frame which comprises:

(a) a one piece C-shaped channel fitted around the perimeter of a sheet of clear plastic or thin glass, a picture or document and a back-up cardboard;

(b) a means for closing and securing said one piece C-channel, in which said one piece C-shaped channel comprises:

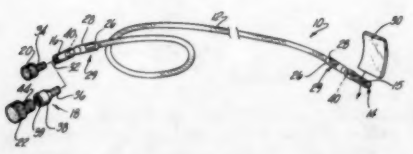
(c) a front wall;
(d) a rear wall having a continuous series of apertures on dovetails, said dovetails formed by cut out areas in said wall; and
(e) a top wall affixed to said front wall and said rear wall.

4,399,626
PHOTO DISPLAY DEVICE
Mel Braverman, 11 St. Andrews La., Glen Cove, N.Y. 11542, and Joseph Lazar, 102-03 65th Rd., Forest Hills, N.Y. 11375
Filed Feb. 2, 1981, Ser. No. 230,534
Int. Cl.³ G09F *19/00*
U.S. Cl. 40—530 **9 Claims**



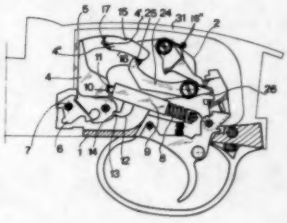
1. A display device for displaying selected items comprising:
a base;
an upright standard being mounted to and supported by the base;
a display frame having multiple side panels and mounted on the standard for rotation about a vertical axis;
support rod means for supporting the selected items to be displayed, the support rods having a generally "U" shaped portion with opposing legs and an intermediate leg connecting the opposing legs; and
means for mounting the "U" shaped portion of a support rod to a side panel such that the "U" shaped portion extends away from the display frame and the intermediate leg is disposed in spaced apart relation from the side panel to which the support rod is mounted.

4,399,627
FLEXIBLE CLEANING SHAFT WITH BRUSH ADAPTER
Edwin V. Malesky, 2727 Academy, and Lawrence C. Malesky, 6 Waynewood Ct., both of Dearborn, Mich. 48124
Filed Oct. 12, 1979, Ser. No. 84,397
Int. Cl.³ F41C *31/00*
U.S. Cl. 42—1 BC **6 Claims**



1. A gun barrel cleaner comprising:
a flexible but torque resistant shaft;
a link having an elongated slot;
means for swively securing said link to one end of said shaft;
a first coupling having a threaded internal bore;
means for swively securing said coupling to the other end of said shaft, and
an adapter sleeve having a threaded internal bore which is larger than said bore in said first coupling, said adapter sleeve having a threaded stem which threadably and detachably engages the threaded internal bore of said coupling.

4,399,628
FIRING MECHANISM FOR FIREARMS
Gianfranco Franchi, Monticelli Brusati, and Giovanni Gamba, Gardone V.T., both of Italy, assignors to Le Armerie Italiane F.LLI Gamba S.n.c., Italy
Filed Dec. 30, 1980, Ser. No. 221,379
Claims priority, application Italy, Oct. 29, 1980, 5232 A/80
Int. Cl.³ F41C *19/00*
U.S. Cl. 42—42 R **7 Claims**

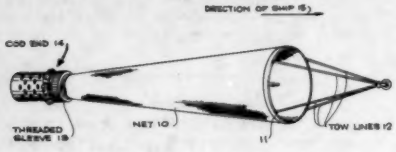


1. A tripping and firing mechanism for use with a double-barrel shotgun having a housing and firing pins comprising: an underguard coupled with the shotgun housing; two hammers mounted on pivot means in said underguard and associated with the firing pins of the double-barrel shotgun; each of the hammers having, at an upper part thereof, an arming tooth and a safety tooth; two arming levers for arming said hammers upon opening of the barrels of the shotgun; two pressure springs acting on said hammers to displace them toward the firing pins; and at least one trigger connected to a trigger actuated balancing lever having a pair of steps each at a different height for controlling the disengagement of said hammers in either a fixed or in a variable sequence; a tripping rod and a safety lever cooperating with each of said hammers and arranged to engage the respective arming tooth and safety tooth provided in the upper part of each hammer, said tripping rod and safety lever of each hammer engageable with respective ones of said pair of steps provided on said balancing lever; said tripping rod and safety lever of each hammer being in two different planes and being separately, even if concurrently, controlled by said balancing lever.

4,399,629
COLLECTING APPARATUS
Charles P. Duncan, Walnut Creek, Calif., assignor to The United States of America as represented by the United States Department of Energy, Washington, D.C.
Filed Mar. 5, 1981, Ser. No. 240,688
Int. Cl.³ A01K *73/00*
U.S. Cl. 43—4 **7 Claims**

1. In a towed type collecting apparatus for small aquatic or airborne organisms having a tapering collecting net and a collecting means removably secured to an apex of said tapering net, the improvement comprising:
said collecting means consisting of:
(a) a removable, apertured container, and
(b) a porous collecting bag removably retained within said container, said collecting bag including an open end portion adapted to be folded over an outer section of said apertured container;

said collecting bag being retained in said apertured container at least by compression of screw-threaded connecting



means for removably connecting said container to said tapering net.

4,399,630

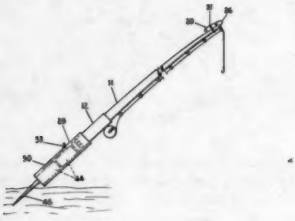
FISH DETECTING FISHING ROD AND HOLDER

Elmer E. Lawes, Box 244, Moline, Mich. 49335

Filed Feb. 12, 1981, Ser. No. 233,978

Int. Cl.³ A01K *97/12*

U.S. Cl. 43—17 **4 Claims**



1. A fish detecting fishing rod and holder comprising:

a fishing rod;

a mercury switch mounted near the tip of said rod;

a handle on the lower end of said rod having electrical plug receiving means at the base thereof;

a rod holder sized to receive and hold said rod handle and having electrical plug means to plug into said handle plug receiving means;

an electrical alarm;

a power source for said alarm;

electrical connecting means connecting said mercury switch and said handle plug receiving means; and

electrical connecting means connecting said holder plug means, said alarm and said power source.

4,399,631

FISHING ROD WITH BITE SIGNALING MEANS

Claude T. Smith, 625 Sylvan St. #2, Daly City, Calif. 94014

Filed Mar. 30, 1981, Ser. No. 248,955

Int. Cl.³ A01K *97/12*

U.S. Cl. 43—17 **3 Claims**

1. A fishing rod adapted for providing a signal in response to a bite or nibble, comprising

an elongated rod having a handle at one end and an outer end,

first guide means arranged along the rod and at its outer end for passage of a fishing line therethrough,

a short signal rod movably mounted on a first one box at the outer end of the elongated rod and substantially parallel thereto,

second guide means being formed on the signal rod for passage of the line therethrough after passage through said first guide means,

the short rod portion and the tip end of the elongated rod including electrical contacts,

an electrical signal circuit being connected with the contacts,

the second guide means on the signal rod and the first guide means at the tip end of the elongated rod being relatively

arranged so that a bite, nibble or downward pull on the line moves the signal rod and causes the circuit to generate a signal, and means on a second box on the outer end of the elongated rod for adjusting the resilient response of the signal rod to force on the line.

4,399,632

TOY HAVING PLURALITY OF PARTS CAPABLE OF DISENGAGING UPON ROTATION

Takeo Iseki, Tokyo, Japan, assignor to Tomy Kogyo Co., Inc., Tokyo, Japan

Filed Jun. 8, 1981, Ser. No. 271,440

Claims priority, application Japan, Oct. 24, 1980, 55-151883[U]

Int. Cl.³ A63H *33/00*

U.S. Cl. 46—16 **9 Claims**

1. A toy which comprises:

a first member;

rotation means associated with said first member, at least a portion of said rotation means capable of rotating with respect to said first member at a first axis of rotation;

a second member capable in a first instance of being associated with said first member;

coupling means detachably coupling said second member to said rotating portion of said rotation means so as to transfer rotary movement of said rotating portion of said rotation means to said second member to rotate said second

member with respect to said first member through a portion of one rotation;

said rotation of said second member with respect to said first member comprises rotation about a second member axis of rotation, said second member axis of rotation coincidental with said first axis of rotation in said first instance;

means located on one of said first or said second members and capable of interacting with the other of said first or said second members to incline the axis of rotation of said second member with respect to said first axis of rotation in response to said second member rotating through a portion of one rotation with respect to said first member such that in a second instance in response to said second member rotating through said portion of one rotation and said axis of rotation of said second member being inclined with respect to said first axis of rotation said second member is capable of disassociating from said first member.

4,399,633

PRODUCTION OF ALKALI METAL OR ALKALINE EARTH METAL PEROXIDES

Douglas P. Haughey, Chester, and Malcolm H. Millar, Liverpool, both of England, assignors to Interox Chemicals Limited, London, England

Filed Apr. 9, 1981, Ser. No. 252,323
Int. Cl.³ C01D 1/02
U.S. Cl. 47—57.6 **12 Claims**

1. A process for the preparation of an alkali metal or an alkaline earth metal peroxide comprising reacting hydrogen peroxide and a hydroxide or oxide of the alkali metal or alkaline earth metal in an aqueous medium, separating the peroxide from the aqueous medium in the form of a moist peroxide product, and drying the moist peroxide product by means of a direct fired pneumatic conveyor drier, said moist peroxide having a moisture content of from 10% to 45% by weight, and said drier being operated at an air inlet temperature of at least 150° C.

4,399,634

SIMPLIFIED ROOT AUGMENTATION SYSTEM FOR HYDROPONICS

Louis R. O'Hare, 1700 Banyan, Apt. 3, Fort Collins, Colo. 80526

Filed Oct. 27, 1981, Ser. No. 315,718
Int. Cl.³ A01G 31/02
U.S. Cl. 47—59 **7 Claims**

1. A method of growing hydroponic plants which augments the plant's root mass and suspends the roots for aerosol nutrification comprising:

(1) growing a plant in a container such as a trough by supporting the seed and the roots developing from it in suitable nourishment in the base of the container and admitting air and sunlight to the plant within the container and

(2) by allowing the plant to grow naturally until significant branch and foliage has formed,

(3) excluding light from a significant portion of the lower branches by the use of a cover and at the same time,

(4) periodically soaking the darkened portion of the branches with nutrient hydroponic solution, converting the branches to a suspended root system and

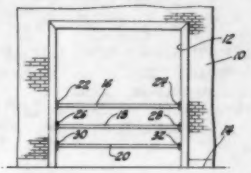
(5) continuing the nutrient solution application to the newly formed roots for the life of the plant.

4,399,635

REMOVABLE GATE

August J. Darga, 5886 Shea Rd., Marine City, Mich. 48039

Filed Aug. 4, 1982, Ser. No. 405,180
Int. Cl.³ E06B 7/00
U.S. Cl. 49—57 **1 Claim**



1. In a building having an opening with opposed parallel vertical sides, a gate comprising:

a plurality of horizontal elongated, tubular members each disposed at a selected predetermined height above the ground;

bracket means mounted on the opening sides for supporting each end of said tubular members, the bracket means for at least one end of each tubular member comprising;

a U-shaped body having a base and a pair of legs defining an opening for receiving the end of the tubular member by a motion between the open ends of the legs;

means for fastening the body to the side of the building opening;

a finger mounted on the ends of said pair of legs and spanning the legs to form a closure therebetween;

a pivot member connecting one end of the finger to the end of said legs such that the finger is movable in a plane at right angles to said legs, between an open position permitting the tubular member to be received between the opening between the legs to a position between the legs, and a closed position in which the finger prevents removal of the tubular member from its position between the legs; and the end of the finger having an opening; and

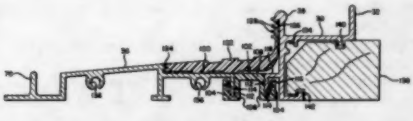
fastener means mounted on the opposite leg so as to be receivable in said opening to prevent the finger from moving parallel to the legs to thereby prevent the tubular member from being accidentally removed from its position between the legs.

4,399,636

THERMAL INSULATED DOORSILL APPARATUS WITH INSULATING SPACER FASTENER

Donald W. Blackwell, Bend, Oreg., assignor to Pozzi Window Company, Inc., Bend, Oreg.

Filed Oct. 21, 1981, Ser. No. 313,452
Int. Cl.³ E06B 7/16
U.S. Cl. 49—469 **14 Claims**



1. Doorsill apparatus for installation beneath an exterior door, comprising:

an outer doorsill member of metal extending outside of said door and having a first projection thereon;

an inner doorsill member of metal extending inside of said door having a second projection thereon;

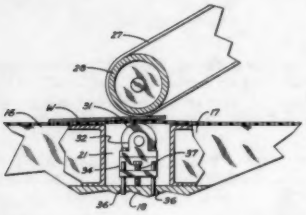
spacer clip means of synthetic plastic material for fastening said outer sill member and said inner sill member together against relative movement by clipping onto said first and second projections, said clip means spacing said outer sill member from said inner sill member for heat insulation thereof and including a bridge portion extending across the space between said inner and outer sill members providing a substantially continuous upper surface from said inner sill member to said outer sill member.

4,399,637

ABRASIVE GRINDING MACHINE

Clarence I. Steinback, Edina, Minn., assignor to Acrometal Products, Inc., Minneapolis, Minn.

Filed Jan. 23, 1981, Ser. No. 227,548
Int. Cl.³ B24B *21/04*
U.S. Cl. 51—138 **20 Claims**



1. An abrasive grinding machine comprising:

(a) a bed defining a substantially planar longitudinal support surface;

(b) endless flexible conveyor belt means longitudinally movable over the planar support surface to carry workpieces thereover;

(c) grinding head means overlying the support surface and conveyor belt means in predetermined spaced relation thereto and defining a grinding area therewith for grinding workpieces as they are carried thereby;

(d) and means disposed in direct opposition to the grinding area for pressing each workpiece into abrasive contact with the grinding head means at said grinding area, and for elevating the flexible conveyor belt means and each workpiece from said support surface in said grinding area, whereby the flexible conveyor belt means is deflectable by the workpiece as it approaches and leaves the grinding area.

4,399,638

SWITCHING SYSTEM FOR AN AIR-DRIVEN TOOL

Stanley Rodowsky, Jr., and R. Kent Nicholson, both of Baltimore, Md., assignors to Black & Decker Inc., Newark, Del.

Filed Sep. 1, 1981, Ser. No. 298,309
Int. Cl.³ B24B *23/00*
U.S. Cl. 51—170 R **21 Claims**

1. A switching system for a tool driven by a turbine rotatively mounted in a housing connected to a source of vacuum, comprising:

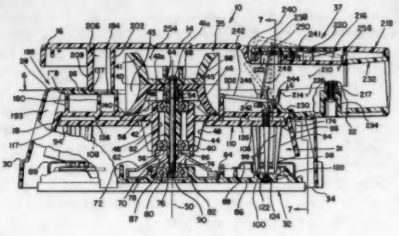
(a) passageway means in the housing for communicating the turbine with the source of vacuum;

(b) the turbine being driven when gas flows through the passageway means from the turbine to the source of vacuum;

(c) the housing having aperture means for communicating ambient gas with the source of vacuum;

(d) bypassing means connected to the housing for selectively switching from a first position for driving the turbine to a second position for stopping the turbine;

(e) the first position permitting gas to flow from the turbine to the source of vacuum, and the second position permitting ambient gas to flow from the aperture means to the source of vacuum;



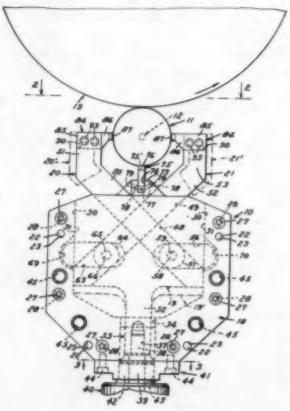
(f) biasing means for normally urging the bypassing means to stop the turbine, but insufficient to overcome a pressure differential at the aperture means when the bypassing means has been switched to drive the turbine.

4,399,639

TRUE CENTERING STEADY REST

Richard J. Lessway, 25547 Ridgewood Dr., Farmington Hills, Mich. 48018

Filed May 26, 1981, Ser. No. 266,996
Int. Cl.³ B24B *41/06*
U.S. Cl. 51—238 S **10 Claims**



1. A true centering steady rest for supporting an elongated cylindrical, rotatable workpiece, characterized in that said steady rest includes:

(a) a housing;

(b) a pusher arm slidably mounted in said housing for movement axially toward and away from the longitudinal centerline of a workpiece to be supported, and carrying a wear pad for supporting engagement with a workpiece at a first workpiece engagement position and having flat opposite side surfaces;

(c) a pair of side arms slidably mounted in a pair of side arm angled slots which are disposed in a crisscross manner, and which are formed in said pusher arm, with one side arm slot in one flat side surface of the pusher arm and the other side arm slot in the other flat side surface of the pusher arm;

(d) said side arms each carry a wear pad for supporting engagement with a workpiece;

(e) cam means for restraining each of said side arms against movement axially of the longitudinal axis of the said pusher arm but which permits crosswise movement of the side arms relative to the longitudinal axis of said pusher arm and toward and away from a workpiece to move the wear pads carried by the side arms in a straight line on a workpiece radial line that extends to the workpiece longitudinal centerline; and,

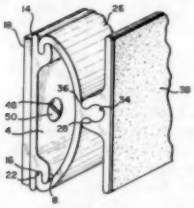
(f) means for moving said pusher arm toward and away from said workpiece, whereby when said pusher arm is moved toward the workpiece, the wear pad on the pusher arm and the wear pads on the side arms are moved along straight workpiece radial line travel paths into supporting engagement with the workpiece, and when the pusher arm is moved away from the workpiece, the wear pads are retracted from the workpiece along the same straight workpiece radial line travel paths.

4,399,640

THERMAL INSULATION DEVICE

Michael W. Porter, 5633 Derby Ct., Apt. #22, Alexandria, Va. 22311

Filed Jun. 8, 1981, Ser. No. 271,560
Int. Cl.³ E06B *3/26, 3/28;* A47H *3/00*
U.S. Cl. 52—202 **13 Claims**



1. A snap-on insulation barrier for window frames and the like including:

(a) an elongated base member having means for securing said base member to said frame,

(b) said base member being generally of strip configuration and having a pair of opposed rails having portions extending upwardly and outwardly from said base member,

(c) said base member having side members,

(d) said side members extending beyond said outwardly extending portions a substantial distance and forming with said outwardly extending portions of said rails a pair of opposed U-slots,

(e) a second strip having a substantially C-shaped cross section and having inturned ends for engaging in said U-slots and having inside and outside surfaces,

(f) said second strip having on said outside surface a first engaging means running the length thereof,

(g) a third strip having inside and outside surfaces and having second engaging means running the length of said third strip inside surface for cooperating with said first engaging means and for detachably securing thereto, said first and said second engaging means including an upstanding bead for engaging an expandable slot formed by opposed flexible rails,

(h) said third strip having its outside surface substantially flat and including a pressure sensitive material,

(i) an outer sheet secured to said third strip outside surface by said pressure sensitive material, and

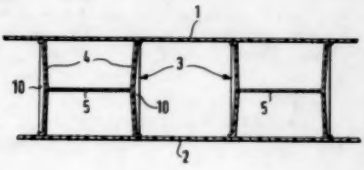
(j) said strips conformable to said frame.

4,399,641

SYNTHETIC RESIN GLASS INSULATING PANE

Gerhard Schloemer, and Klaus Steinweg, both of Lüdenscheid, Fed. Rep. of Germany, assignors to Firma Gerhardi & Cie, Fed. Rep. of Germany

Filed Aug. 20, 1980, Ser. No. 179,648
Claims priority, application Fed. Rep. of Germany, Sep. 1, 1979, 2935456
Int. Cl.³ E04C *2/54*
U.S. Cl. 52—309.1 **11 Claims**



1. A synthetic resin glass insulating pane, consisting of at least two plates with web frames between the plates, edges of the web frames welded with the plates, characterized by:

(a) the web frames are provided as substantially tubular bodies;

(b) at least one edge of the web frames are provided with outwardly projecting edge shoulders and, integral therewith, ultrasonic aligning webs project vertically and contact said plates; and,

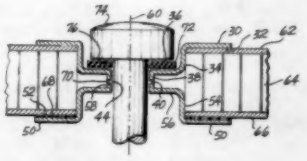
(c) side walls of the web frames form side faces of a double frustum.

4,399,642

AIRCRAFT FLOOR PANEL INSTALLATION SYSTEM

Ronald E. Bard; Friedrich J. Gorges, both of Seattle, and Robert M. Halsey, Auburn, all of Wash., assignors to The Boeing Company, Seattle, Wash.

PCT No. PCT/US80/00810, § 371 Date Jun. 24, 1980, § 102(e) Date Jun. 24, 1980, PCT Pub. No. WO82/00324, PCT Pub. Date Feb. 4, 1982
PCT Filed Jun. 24, 1980, Ser. No. 250,751
Int. Cl.³ F04C *2/54*
U.S. Cl. 52—483 **3 Claims**



1. An aircraft floor installation apparatus and system for floor panels having an upper and a lower facesheet separated by a core and provided with fastening holes, for mounting to an airplane floor beam structure provided with mounting means, comprising in combination:

(a) a first dimpled washer having a first washer surface positioned on said upper facesheet, a first sleeve portion and a second washer surface, disposed inside said fastening hole,

(b) a second dimpled washer having a first washer surface positioned on said lower facesheet, a first sleeve portion, a second washer surface, disposed inside said fastening hole in opposed relationship to said first dimpled washer,

(c) a resilient sealing material disposed between said second

surface of said first dimpled washer and said second surface of said second dimpled washer and,

(d) an associated fastener with a head portion, an annular bottom head surface, and a shank portion, adapted to fasten said panel onto said floor beam structure through said fastening hole and said mounting means whereby upon installation of said fastener, said annular bottom head surface applies pressure on said second washer surface of said first dimpled washer causing therein a first spring biased force and a sealing arrangement with said resilient material while a stop is provided to said fastener installation by said second washer surface of said second dimpled washer so that a spring biased, sealed and controlled positioned sunken fastener and panel to floorbeam installation is accomplished.

4,399,643

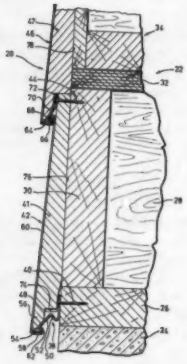
PANEL LOCK STRUCTURE

Joseph A. Hafner, 91 Dover Dr., Stoney Creek, Canada L8G 2M3

Continuation-in-part of Ser. No. 85,352, Oct. 16, 1979, abandoned. This application Dec. 1, 1980, Ser. No. 211,619

Int. Cl.³ E04D *1/28*

U.S. Cl. 52—530 **4 Claims**



1. A building structure having an outer wall covering comprising:

a plurality of elongated insulated backer boards having upper and lower surfaces arranged substantially in contact with one another, the backer boards being attached to the building structure and arranged to transfer compressive vertical loads from each of the backer boards to adjacent backer boards;

a plurality of interlocked and elongated siding panels arranged in lapped relationship, each of these panels having rearwardly extending upper and lower lands and a main portion covering at least a substantial portion of the vertical extent of one of the backer boards, the panels being attached to the outer wall;

a starter structure attached to the outer wall and positioned at the bottom of the wall covering, the starter structure including an outwardly extending portion positioned immediately under a lowermost one of the backer boards and in engagement with the underside of this backer board and immediately above the lower land of the bottom one of the siding panels so that compressive loading in this backer board is relieved by the starter structure, the compressive loading also serving to lock the starter structure portion between the lowermost backer board and the lower land of the bottom panel to prevent separation of the panel from the starter structure as a result of the compressive loading in the backer board.

4,399,644

CHANNEL-SHAPED STRIPS

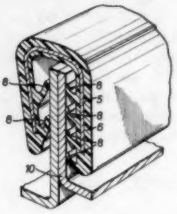
Robert G. Bright, Viersen, Fed. Rep. of Germany, assignor to Draftex Development AG, Zug, Switzerland

Filed Sep. 21, 1982, Ser. No. 420,528

Claims priority, application United Kingdom, Jan. 25, 1982, 8202039

Int. Cl.³ E06B *7/18, 7/22*

U.S. Cl. 52—716 **8 Claims**



1. A channel-shaped strip, comprising a reinforcing channel-shaped carrier, and

channel-shaped flexible material in which the carrier is embedded,

substantially all of the flexible material on the inside of the carrier being such that the carrier is visually apparent through it and substantially all of the channel-shaped flexible material on the outside of the carrier visually concealing the carrier.

4,399,645

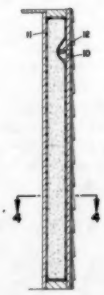
BLADDER INSULATION

Paul D. Murphy, Frankfort, and Clinton A. Reph, Amherst, both of Ohio, assignors to Lou Weitz; Jeriline Ward, both of Shaker Hts. and Joy Murphy, Bowling Green, all of, Ohio, part interest to each

Filed Dec. 15, 1980, Ser. No. 216,320

Int. Cl.³ E04G *9/10;* **E04B** *1/62;* **E04G** *23/00*

U.S. Cl. 52—743 **7 Claims**



1. A method of making film bladder insulation in a completed structure consisting of:

A. providing an opening between studs;

B. spraying the studs with an adhesive before insertion of the film;

C. securing a bladder of impervious film between the studs, said film being a member from the group consisting of polyurethane, polyethylene, and polypropylene from 4 to 15 mils in thickness;

D. pressing the film against the studs by means of a gaseous medium to fasten the same and providing a means for rigidifying the bladder;

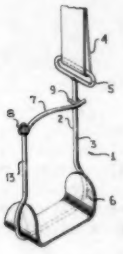
E. filling said bladder with insulation from the group consisting of vermiculite, mineral wool, microballons of glass or plastic, perlite and eggcrates.

4,399,646

SAFETY STIRRUP

Lundie P. Thayer, Box 386, Fort Washakie, Wyo. 82514

Filed Sep. 15, 1981, Ser. No. 302,594
Int. Cl.³ B68C *3/00*
U.S. Cl. 54—49 **6 Claims**



1. A safety stirrup comprising:

a generally U-shaped member having two posts which extend along adjacent axes and a lower portion connecting lower ends of said posts for receiving a rider's foot,

a safety release and forward guard comprising a horizontal member spaced from said lower portion and having one end pivotally attached to a first of said posts for rotation about said axis of said first post, and the other end releasably attached to the second of said posts, one of said post extending upwardly beyond said safety release and forward guard and being attachable to a saddle strap,

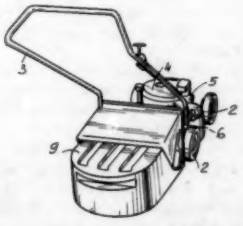
whereby said safety release and forward guard acts to prevent a foot of a rider from going too far into the stirrup and also releases the rider's foot from the stirrup when pivoted about said first post.

4,399,647

MOTORIZED LAWN-MOWER, PROVIDED WITH A RIGID CUT GRASS COLLECTING VESSEL, INCLUDING A REMOVABLE BAG

Teodoro Soldavini, Via Leonardo da Vinci, 20062-Cassano D'Adda, (Milano), Italy

Filed Jul. 31, 1981, Ser. No. 289,052
Claims priority, application Italy, Aug. 12, 1980, 24117 A/80
Int. Cl.³ A01D *35/22*
U.S. Cl. 56—202 **1 Claim**



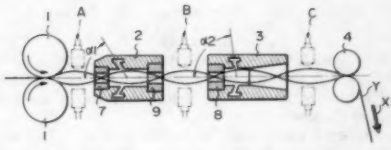
1. In a lawn mower having a cut grass collector box having an open end for receiving cut grass, a screen supported at said open end of the collector box and apertured to allow entry of cut grass into the collector box but to hold back cut grass accumulated in the collector box, the improvement which comprises hinge means connected to said collector box and to said screen, said hinge means being spaced apart from said collector box along a region thereof bordering the open end of the collector box to thereby allow the folding back along said region of the open edge portion of an opened grass collector bag inserted into the collector box, said hinge means being comprised of first and second members, one of said members being attached to said collector box, and the other said member being attached to said screen, said screen being disposed for insertion into the open end of the collector box to hold back therein said accumulated cut grass, said first and second members having hook-shaped portions allowing the collector box and screen to be hung together along a common support with one of said first and second members hooked shaped portion in underlying relation to the other.

4,399,648

METHOD FOR EVALUATION OF BALLOONS OF YARN-LIKE PRODUCTS

Hisaaki Kato, Shiga, Japan, assignor to Murata Kikai Kabushiki Kaisha, Kyoto, Japan

Filed Jun. 24, 1981, Ser. No. 276,789
Claims priority, application Japan, Jun. 26, 1980, 55-87628
Int. Cl.³ D01H *13/16, 13/14*
U.S. Cl. 57—265 **3 Claims**



1. A method for evaluation of balloons of yarn-like materials, which comprises converting a balloon of a ballooning yarn-like materials to an electric signal by a detector comprising a luminous diode and a photo transistor, amplifying the electric signal to an AD convertible signal to effect Fourier transformation, spectrally analyzing said electric signal to respective frequency components and voltage amplitude components, and evaluating the balloon of the yarn-like material based on the analyzed spectra, wherein said balloon of the yarn-like material is a balloon of a fiber bundle which is produced in a pneumatic yarn spinning method comprising the steps of drafting a sliver, delivering the sliver by front rollers, passing it through fluid jet nozzles to be twisted and produced a spun yarn and being wound on a winding bobbin through take-up rollers, and said converting process of the balloon to the electric signal is performed between the fron rollers and the take up rollers.

4,399,649

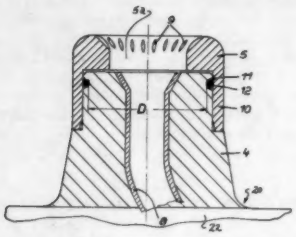
SPINNING FLYER CONSTRUCTION

Kurt Gallina, Fellbach, Fed. Rep. of Germany, assignor to C. Eugen Maier Metallverarbeitung GmbH, Fed. Rep. of Germany

Filed May 29, 1981, Ser. No. 268,186
Claims priority, application Fed. Rep. of Germany, Jun. 24, 1980, 3023546
Int. Cl.³ D01H *7/26*
U.S. Cl. 57—115 **2 Claims**

1. A spinning flyer comprising a rotatable flyer having spaced apart substantially parallel flyer arms with a central web portion connected between said flyer arms, a head projecting outwardly from said web portion in an opposite direction from said arms and having a cylindrical end portion with an annular groove near an outer end of said end portion, a shoulder defined on said head adjacent said cylindrical end

portion and extending radially outwardly therefrom, a steel twist crown having a shank with a cylindrical inner surface slidably engaged over said cylindrical end portion of said head, said shank having a lower end resting on said shoulder, said crown further having a funnel shaped and toothed inlet opening of a diameter adjacent said inner surface which is smaller



than a diameter of said inner surface, and an elastomer O-ring in said annular groove engaged between said cylindrical end portion of said head and said inner surface of said twist crown shank, for inhibiting the movement of said twist crown relative to said head and for inhibiting the removal of said twist crown from said head.

4,399,650

FRICTION TYPE YARN SPINNER

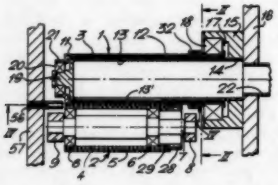
Alan Parker, 7 Darvel Close, Breightmet, Bolton, Lancashire, and William M. Farnhill, 335 Colne Rd., Burnley, Lancashire, both of England

Continuation-in-part of Ser. No. 88,262, Oct. 25, 1979, Pat. No. 4,315,398. This application Nov. 24, 1981, Ser. No. 324,465

Claims priority, application United Kingdom, Oct. 26, 1978, 42074/78; Jun. 6, 1979, 7926163; Aug. 4, 1979, 7927245

Int. Cl.³ D01H *1/135*

U.S. Cl. 57—401 **4 Claims**



1. In a yarn spinning apparatus, comprising, in combination,

a pair of rollers, one having a perforate peripheral surface providing communication therethrough with an interior hollow space, and means associated therewith for providing a flow of air therethrough into said hollow space, and the other roller having a substantially imperforate peripheral surface;

means for mounting said rollers in close adjacency to one another for rotation about their respective axes such that said peripheral surfaces define therebetween an elongate throat space extending outwardly from a gap space separating said rollers at their points of closest adjacency;

fiber feed means for feeding discrete fibers to said throat space;

means for rotating said rollers concurrently and in the same rotational sense, and for thereby twisting said fed fibers to form a yarn in said throat space; and

means for withdrawing said yarn as it is formed and for collecting the same;

the improvement comprising:

said means for feeding said fibers including means for delivering said fibers within said throat space to a yarn formation zone thereof adjacent said gap space; and

said means for rotating said rollers including means for rotating said imperforate roller such that a point on said surface thereof is moved from said gap space outwardly through said yarn formation zone and throat space, and for concurrently rotating said perforate roller such that a point on its said peripheral surface is moved inwardly through said throat space and yarn formation zone to and through said gap space.

4,399,651

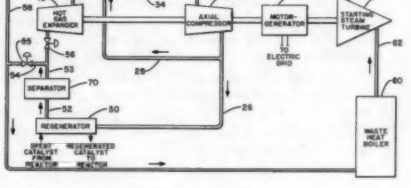
METHOD FOR STARTING AN FCC POWER RECOVERY STRING

Carl H. Geary, Jr., Greensburg, Pa., and Norman A. Samurin, Houston, Tex., assignors to Elliott Turbomachinery Co., Inc., Jeannette, Pa.

Filed May 28, 1981, Ser. No. 267,936

Int. Cl.³ F02G *3/00*; F02C *7/26*

U.S. Cl. 60—39.02 **6 Claims**



1. A method for starting a power recovery string of a fluid catalytic cracker system where the string includes an expander means, constant volume compressor means and driving means, including the steps of:

rotating the power recovery string by means of the driving means to cause the compressor means to draw in ambient air which is compressed and heated thereby;

delivering at least a portion of the compressed, heated air from the compressor means to a catalytic regenerator means for initially drying the fluid catalytic cracker system and subsequently supporting combustion in the regenerator means;

expanding at constant temperature and delivering a portion of the compressed, heated air from the compressor means back to the inlet of the compressor means for at least a portion of the startup period to raise the temperature and thereby increase the specific volume of the ambient air supplied to the compressor means which reduces the power load on the driving means;

increasing the rotational speed of the power recovery string;

igniting the dried, spent catalyst in the regenerator means to produce hot combustion products which are used to drive the expander means and thereby the power recovery string; and

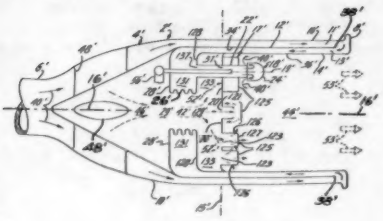
concurrently bringing the power recovery string up to speed, disabling the driving means and stopping the delivery of expanded, heated air back to the iniet of the compressor means.

4,399,652

LOW BTU GAS COMBUSTOR

Rossa W. Cole, East Rutherford, and Anthony Leto, Franklin Lakes, both of N.J., assignors to Curtiss-Wright Corporation, Wood-Ridge, N.J.

Continuation-in-part of Ser. No. 248,970, Mar. 30, 1981, abandoned. This application Aug. 21, 1981, Ser. No. 294,918
Int. Cl.³ F02C 7/224
U.S. Cl. 60—39.465 2 Claims



1. A combustion apparatus for burning a low BTU fuel and having a fuel feed end portion for receiving a low BTU fuel from a source thereof and a longitudinal, opposed distal end portion to pass products of combustion therefrom comprising

(a) a casing of generally cylindrical shape having spaced apart outer and inner walls joined at their distal ends and an intermediate wall disposed to extend between the inner and outer walls to thereby define inner and outer annular spaces intercommunicating beyond the distal end portion of said intermediate wall;

(b) said outer annular space being in communication with said fuel feed end portion to receive low BTU fuel;

(c) wall means extending substantially normal to the inner and intermediate walls and connecting with the latter walls and defining a first plenum chamber communicating with said inner annular space to receive low BTU fuel from the inner and outer annular spaces;

(d) said wall means defining an annular channel having a longitudinal axis coincident with the longitudinal axis of said combustion apparatus and in communication with a source of oxidant to receive oxidant from the latter;

(e) a headplate disposed to extend in spaced relationship with said wall means and connected to the inner wall of the casing to define a second plenum chamber adjacent one side thereof and a combustion chamber on the opposite side thereof;

(f) said second plenum chamber being in communication with said annular channel to receive oxidant from the latter;

(g) port means in said headplate to pass oxidant from the second plenum chamber into the combustion chamber;

(h) a plurality of combustor units supported in said headplate so as to extend through and out of communication with said second plenum and into said combustion chamber for communication with the latter; and

(i) each of said combustor units being in communication with the first plenum chamber to receive low BTU fuel from the latter and to pass the same into the combustion chamber for admixture with the oxidant and combustion of the fuel.

4,399,653

AUTOMATIC ADJUSTING DECELERATION CONTROL FOR A HYDROSTATICALLY POWERED DEVICE

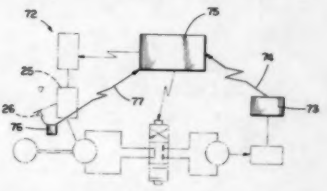
John A. Pylat, Jr., 2378 Topaz Dr., Troy, Mich. 48098

Filed Mar. 14, 1980, Ser. No. 130,561
Int. Cl.³ F15B 9/04
U.S. Cl. 60—327 18 Claims

16. A method for controlling the operation of a hydrostatically powered device, which includes a prime mover, a variable displacement hydraulic pump, hydraulic actuator means for driving a load through an operating cycle of acceleration, travel, deceleration and travel, and control means for regulating drive operation, comprising the steps of:

(a) sensing minimum pump displacement of the device,

(b) sensing absolute load position in the operating cycle at the point of minimum pump displacement following deceleration;



(c) comparing the sensed load position with the theoretical load position within the operating cycle at the point deceleration should be complete; and

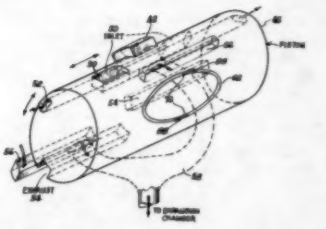
(d) correcting for variations between the sensed and theoretical load positions by advancing or retarding the point at which deceleration is initiated in the next operating cycle.

4,399,654

POWER PLANT HAVING A FREE PISTON COMBUSTION MEMBER

Constant V. David, 4952 Field St., San Diego, Calif. 92110

Filed Feb. 19, 1982, Ser. No. 350,326
Int. Cl.³ F02B 71/04
U.S. Cl. 60—595 16 Claims



1. A power plant comprising:

means for supplying compressed air;

a combustion member including a sleeve with axially spaced inlet means and outlet means and igniting means at each end of the sleeve, a free piston mounted in the sleeve for axial sliding movement and including spaced inlet and outlet means;

means for introducing fuel to form a fuel-air mixture for burning in the combustion member to produce combusted gas;

means for imparting rotational movement to the piston as it slides axially so that the inlet and outlet means in the piston are registered with the inlet and outlet means in the sleeve in proper timed sequence to provide intake and exhaust valving functions; and

means for receiving and expanding the combusted gas to drive a power delivery member.

4,399,655

PYROTECHNICAL DRIVING DEVICE ESPECIALLY FOR A RETIGHTENING DEVICE OF A SAFETY BELT SYSTEM

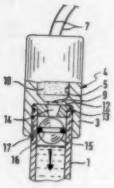
Artur Föhl, Schorndorf, Fed. Rep. of Germany, assignor to REPA Feinstanzwerk GmbH, Alfdorf, Fed. Rep. of Germany

Filed Sep. 10, 1981, Ser. No. 301,045

Claims priority, application Fed. Rep. of Germany, Sep. 11, 1980, 3034257

Int. Cl.³ F01B *29/08*

U.S. Cl. 60—637 **12 Claims**



1. Pyrotechnical driving device, including a pyrotechnical driving device for a back-tightening device of a safety belt system, comprising a cartridge containing a propellant charge, a cylinder which contains a driving piston, said cartridge connected to said cylinder, a rupture plate interposed between the propellant charge and the piston, which plate is ruptured due to a pressure increase against the plate after the propellant charge is activated, the combination thereof of a form-stable nozzle plate directly following the rupture plate, said form-stable nozzle plate having a nozzle opening which opening is narrower compared to the rupture plate to prevent occurrence of a sudden pressure drop through the rupture plate.

4,399,656

LONG-PERIOD THERMAL STORAGE ACCUMULATORS

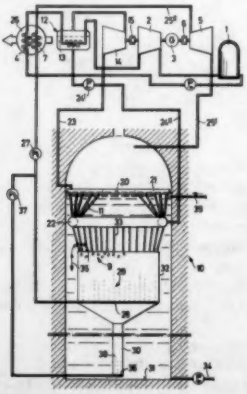
Nikolaus Laing; Ingeborg Laing, and Oliver Laing, all of Hofener Weg 35-37, 7141 Aldingen, Fed. Rep. of Germany

Division of Ser. No. 860,191, Dec. 15, 1977, Pat. No. 4,174,009, which is a continuation of Ser. No. 616,256, Sep. 24, 1975, abandoned. This application Mar. 26, 1979, Ser. No. 23,675

Claims priority, application Austria, Sep. 30, 1974, 7858/74; Nov. 20, 1974, 9290/74; Apr. 30, 1975, 3312/75

Int. Cl.³ F01K *3/00, 13/00;* **F28D** *1/00*

U.S. Cl. 60—659 **7 Claims**



1. A combination of a long period heat storage accumulator adapted to contain a large volume of water and a power station, said accumulator having means for filling and removing water therefrom and said power station having a turbine, a refrigeration compressor having a liquified refrigerant and a clutch for operatively connecting said turbine and said compressor; the improvement comprising in that said accumulator is contained within a cavern formed in a salt rock formation whereby the pressure of the water in the accumulator is contained by the rock formation, in that the water comprises a saturated salt solution obtained by dissolution of the salt rock formation, in that the accumulator has a heat exchanger therein acting as a condenser for the turbine, in that means are provided for feeding a liquified refrigerant into the accumulator whereby a brine mixture is formed, and in that a means is provided for bringing a brine ice mixture into contact with the heat exchanger.

4,399,657

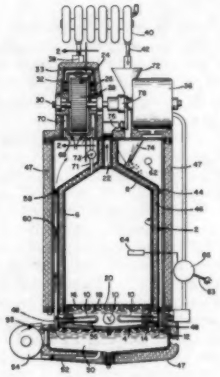
STEAM GENERATION SYSTEM

Clyde F. Berry, R.F.D. 7, Box 169 C, Manchester, N.H. 03104

Filed Apr. 14, 1982, Ser. No. 368,403

Int. Cl.³ F01K *11/00*

U.S. Cl. 60—664 **12 Claims**



1. In combination,

a steam generating unit comprising

a steam boiler and

a feed water chamber within which said boiler is positioned,

a steam turbine comprising a turbine housing and a rotor,

an electrical generator driven by said rotor,

electrical heating elements located in the water of said boiler arranged to be activated by an outside source of current and by current from said generator,

the water in said feed water chamber being heated by radiation from said boiler,

said turbine housing being located within and in spaced relation from an outerhousing,

means for delivering steam from said boiler to said steam turbine, and

means for delivering hot water vapor directly from said steam generating unit to the space between said outer housing and said turbine housing.

4,399,658

REFRIGERATION SYSTEM WITH CARBON DIOXIDE INJECTOR

Dean M. Nielsen, Castro Valley, Calif., assignor to Safeway Stores, Incorporated, Oakland, Calif.

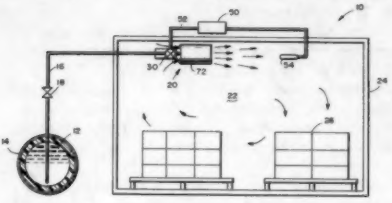
Filed Feb. 8, 1978, Ser. No. 876,178

Int. Cl.³ F17C *7/02*

U.S. Cl. 62—52 **14 Claims**

1. A method for producing refrigeration from a source of pressurized liquid carbon dioxide coolant, comprising the steps

of injecting coolant from the source through a nozzle orifice into a primary stream of solid cross-section while reducing the pressure of coolant entering the stream to cause such coolant to substantially expand into a gas, directing the primary stream of coolant lengthwise through an elongate cylindrical enclosure having an inlet end completely open to ambient gas and an outlet end completely open to a zone to be refrigerated and including strut means mounted between the enclosure inlet end



and nozzle and lying in the path of ambient gas for creating turbulence therein, directing ambient gas in an annular stream which concentrically encloses the primary stream of coolant and in the same direction thereof through the inlet end into the enclosure, mixing ambient gas from the annular stream with coolant in the primary stream in an amount to sublime substantially the entirety of solid coolant therein into a gas, and directing the mixture of ambient gas and coolant from the outlet end of the enclosure into the zone to produce refrigeration.

4,399,659

VAPORIZATION OF SMALL AMOUNTS OF LIQUEFIED GASES

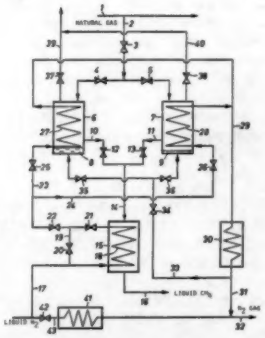
Reinhard Strigl, Munich, Fed. Rep. of Germany, assignor to Linde Aktiengesellschaft, Wiesbaden, Fed. Rep. of Germany

Filed Aug. 27, 1981, Ser. No. 296,665

Claims priority, application Fed. Rep. of Germany, Aug. 30, 1980, 3032822

Int. Cl.³ F17C *7/02*

U.S. Cl. 62—52 **20 Claims**



1. A process for the vaporization of a liquefied gas having a normal boiling point below 100° K., in a sufficiently small quantity to have been vaporized heretofore without use of the cold content therein, comprising vaporizing said liquefied gas in indirect heat exchange with a gaseous medium being a process gas or fuel gas, and using the resultant cooled gaseous medium for industrial or domestic purposes in either the gaseous or liquid form, wherein the gaseous medium contains components having different volatilities and at least one of the components is condensible during the heat exchange step, further comprising condensing said condensible component in at least a first heat exchange stage of said indirect heat exchange stage, separating resultant condensed component from the remaining gaseous medium, and subjecting said condensed component to direct heat exchange with a stream of combustion products of the gaseous medium, or a partial stream of the gaseous medium or of resultant vaporized liquefied gas, to revaporize said condensed component to form an admixture therewith.

4,399,660

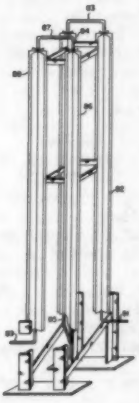
ATMOSPHERIC VAPORIZER

William E. Vogler, Jr., Grand Island, and Thomas G. Halvorson, Lockport, both of N.Y., assignors to Union Carbide Corporation, Danbury, Conn.

Continuation of Ser. No. 233,111, Feb. 10, 1981, abandoned. This application Jun. 10, 1982, Ser. No. 386,998

Int. Cl.³ F17C *7/02*

U.S. Cl. 62—52 **13 Claims**



1. An apparatus for continuously vaporizing a cryogenic liquid by employing heat absorbed from the ambient air comprising at least three substantially vertical positioned passes which are piped together each pass being comprised of a center tube having an outside diameter of from 0.5 to 1.5 inches and provided with 3 to 8 fins substantially equally spaced around said tube, each fin having a radial length of from 1.5 to 7 times the outside diameter of said tube and extending longitudinally along substantially the entire length of said tube, each pass having a length of from 5 to 20 feet and a ground clearance of from 1 to 4 feet, and wherein the ratio of the distance between adjacent fin tips to radial fin length is from 1 to 5 to define a substantially open space between adjacent fin tips.

4,399,661

PROLONGED COLD TEMPERATURE CRYOGENIC COOLER

Peter Durenec, and Steven L. Holt, both of Annandale, Va., assignors to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Aug. 3, 1982, Ser. No. 404,781

Int. Cl.³ F25D *13/04*

U.S. Cl. 62—65 **12 Claims**

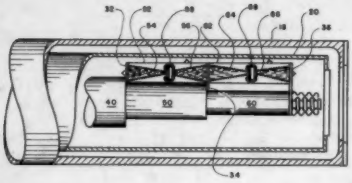
1. A method of speeding the cool down and prolonging the cold temperature times of a cryogenic cooler comprised the steps of:

providing a plurality of cooler stage bellows type thermal switches on the stages of the cold finger of said cryogenic cooler wherein said cooler stage bellows type thermal switches close during cool down to provide a huge heat sink;

attaching a cold station thermal switch on the end of said

cold finger in cooperation with a detector on the end of an inner dewar wall of said cooler; and

precooling said cold finger to cryogenic temperature to cause contraction thereof prior to inserting into said inner dewar to prevent damage to any of the cooler elements



and filling said inner dewar wall with cooling liquid and direct thermal conductivity between said cold finger and said detector prior to cool down and is opened at the cool down cryogenic temperature to eliminate mechanical vibrations transferred from the cooler system through said cold finger to said detector.

4,399,662

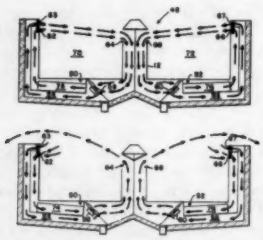
ISLAND REFRIGERATED DISPLAY CASE WITH AIR DEFROST

Fayez F. Ibrahim, Niles, Mich., assignor to Tyler Refrigeration Corporation, Niles, Mich.

Division of Ser. No. 145,859, May 1, 1980, Pat. No. 4,314,457, which is a continuation-in-part of Ser. No. 107,261, Dec. 26, 1979, Pat. No. 4,265,092, which is a continuation-in-part of Ser. No. 76,669, Sep. 18, 1979, Pat. No. 4,314,453, which is a continuation-in-part of Ser. No. 60,459, Jul. 25, 1979, Pat. No. 4,295,340, which is a continuation-in-part of Ser. No. 11,804, Feb. 14, 1979, abandoned. This application Oct. 2, 1981, Ser. No. 308,147

Int. Cl.³ A47F *3/04*

U.S. Cl. 62—82 **20 Claims**



1. An island refrigerated display case comprising:

a cabinet having four outer walls and a bottom wall, first and second interior display spaces with a partition wall separating said display spaces, and an access opening associated with each of said display spaces for enabling access to refrigerated products within said display case;

a first refrigeration air conduit extending along one of said outer walls, said bottom wall and said partition wall of said cabinet so as to extend around said first interior display space and having an air inlet opening at one end of the associated said access opening and an air outlet opening at the other end of the associated said access opening, said inlet opening and said outlet opening being aligned so that air leaving said outlet opening is directed across said access opening and received by said inlet opening so as to establish a refrigerated air curtain across said access opening;

a second refrigeration air conduit extending along the opposite of said outer walls, said bottom wall and said partition wall of said cabinet so as to extend around said second interior display space and having an air inlet opening at one end of the associated said access opening and an air outlet opening at the other end of the associated said access opening, said inlet opening and said outlet opening being aligned so that air leaving said outlet opening is directed across said access opening and received by said inlet opening so as to establish a refrigerated air curtain across said access opening;

first and second air circulating means for circulating air through said first refrigeration air conduit and said second refrigeration air conduit, respectively;

first refrigeration means including a first evaporator coils arranged within said first refrigeration air conduit for cooling air flowing through said first refrigeration air conduit during a refrigeration cycle of operation of said display case;

second refrigeration means including a second evaporator coil arranged within said second refrigeration air conduit for cooling air flowing through said second refrigeration air conduit during a refrigeration cycle of operation of said display case;

a first secondary air conduit extending around said first refrigeration air conduit and having an air outlet opening arranged for directing a flow of air across the associated said access opening such as air flow creating a secondary air curtain across said access opening lying outside of the refrigerated air curtain;

a second secondary air conduit extending around said second refrigeration air conduit and having an air outlet opening arranged for directing a flow of air across the associated said access opening, such air flow creating a secondary air curtain across said access opening lying outside of the refrigerated air curtain;

control means for switching said display case between a refrigeration cycle of operation and a defrost cycle of operation and during such defrost cycle of operation temporarily terminating the operation of said refrigeration means and causing ambient air to be drawn into and flow through both said first and second refrigeration air conduits and said first and second secondary air conduits for causing defrosting of any frost buildup within such conduits and said first and second refrigeration means; and,

means for causing the ambient air during a defrost cycle of operation to be expelled from each of said refrigeration air conduits so as to flow up and away from said display case along a path flowing over the outside of an outer wall of said cabinet so that such expelled ambient air is prevented from reentering said refrigeration air conduits.

4,399,663

MECHANICAL CONTROL SYSTEM FOR PREVENTING COMPRESSOR LUBRICATION PUMP CAVITATION IN A REFRIGERATION SYSTEM

Benjamin F. Hesler, Canastota, N.Y., assignor to Carrier Corporation, Syracuse, N.Y.

Filed Nov. 27, 1981, Ser. No. 325,609

Int. Cl.³ F25B *43/02*

U.S. Cl. 62—193 **8 Claims**

1. A control system for preventing oil pump cavitation by controlling flow of vaporous refrigerant to a compressor in a hermetically sealed refrigeration system of the type wherein a lubricating oil reservoir is located in a housing filled with vaporous refrigerant at a pressure proportional to the refrigerant pressure in the refrigeration system evaporator comprising:

a reservoir for vaporous refrigerant;

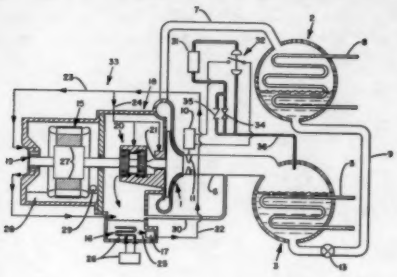
means for connecting the reservoir to the refrigeration system evaporator;

means for permitting refrigerant flow from the evaporator to the reservoir when the pressure in the evaporator exceeds the pressure in the reservoir;

means for controlling the rate of flow of refrigerant from the

reservoir to the evaporator when the pressure in the reservoir exceeds the pressure in the evaporator;

differential pressure sensing means responsive to the difference in pressure between the evaporator and the reservoir; and



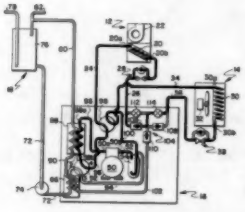
means for controlling the flow of vaporous refrigerant to the compressor from the evaporator in response to the differential pressure sensing means when the differential pressure sensing means senses a predetermined higher pressure in the reservoir than the evaporator.

4,399,664

HEAT PUMP WATER HEATER CIRCUIT

Gregory S. Derosier, Holmen, Wis., assignor to The Trane Company, La Crosse, Wis.

Filed Dec. 7, 1981, Ser. No. 327,858
Int. Cl.³ F25B *27/02*
U.S. Cl. 62—238.7 **20 Claims**



1. A refrigeration circuit comprising an indoor heat exchanger having first and second refrigerant flow connections; an outdoor heat exchanger having first and second flow connections; a compressor having a suction port and a discharge port; a liquid heat exchanger having a refrigerant inlet in communication with said compressor discharge and having a refrigerant outlet; and conduit and valve means for selectively placing said flow connections, said suction port and said refrigerant outlet in flow communication by different conduit paths, including

a. a first path wherein said refrigerant outlet of said liquid heat exchanger is connected to said first flow connection of said indoor heat exchanger, said second flow connection of said indoor heat exchanger is connected to said second flow connection of said outdoor heat exchanger, and said first flow connection of said outdoor heat exchanger is connected to said compressor suction port;

b. a second path wherein said refrigerant outlet is connected to said first flow connection of said outdoor heat exchanger, said second flow connection of said outdoor heat exchanger is connected to said second flow connection of said indoor heat exchanger, and said first flow connection of said indoor heat exchanger is connected to said compressor suction port;

c. a third path wherein said refrigerant outlet is connected to said second flow connection of said indoor heat exchanger, said first flow connection of said indoor heat exchanger is connected to said compressor suction port, said second flow connection of said outdoor heat exchanger is effectively closed, and said first flow connection of said outdoor heat exchanger is connected to said compressor suction port; and

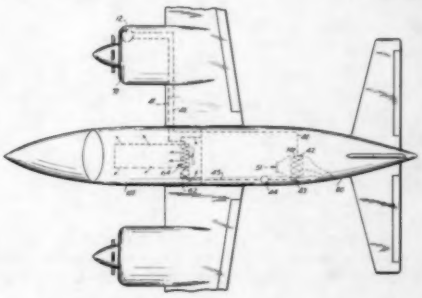
d. a fourth path wherein said refrigerant outlet is connected to said second flow connection of said outdoor heat exchanger, said first flow connection of said outdoor heat exchanger is connected to said compressor suction port, and second flow connection of said indoor heat exchanger is effectively closed, and said first flow connection of said indoor heat exchanger is connected to said compressor suction port.

4,399,665

AIRCRAFT AIR CONDITIONING SYSTEM

Hugh G. Evans, W. 214 6th Ave.; Stephen Speer, S. 358 Couer d'Alene Apt. #6; James S. Christy, E. 10918 26th, all of Spokane, Wash. 99204, and Stanley S. Lafrenz, P.O. Box 1356, Sandpoint, Id. 83864

Filed Dec. 7, 1981, Ser. No. 327,813
Int. Cl.³ B60M *3/04*
U.S. Cl. 62—239 **13 Claims**



1. In an air conditioner system for powered aircraft having at least one engine within an aerodynamically defined engine compartment cowling, the engine compartment containing an engine being a horizontally opposed reciprocating engine having two opposed banks of cylinders (the banks of cylinders being longitudinally offset such that the right bank ends forwardly of the left bank of cylinders), a main starter ring, and driving means for a propeller located along the center axis of the engine immediately forwardly of the opposed banks of cylinders, and an electrical generating means located alongside the starter ring gear and forwardly of the right cylinder bank, and wherein the air conditioner system comprises a refrigerant compressor and means for powering the refrigerant compressor from the engine; the improvement wherein the electrical generating means and the compressor are generally elongated structures extending longitudinally along axes located laterally outwardly from the starter ring gear and forwardly of the right bank of cylinders, and both of the electrical generating means and the compressor being mechanically powered by the engine, the compressor and alternator being so placed that the total frontal surface area of the engine compartment cowling is not increased by the placement of the compressor in such location, and comprising bracket mounting means secured to a lateral surface of the engine, forwardly of the right bank of cylinders and rearwardly of the main starter ring gear, the bracket mounting means comprising a first bracket extending outwardly and downwardly from the lateral wall of the engine

and located beneath the horizontally extending cylinders, and a second bracket extending laterally outwardly beyond the first bracket; the electrical generating means being secured to and supported by the first bracket and extending below the right cylinder bank, and the second bracket being secured to and supporting the refrigerant compressor adjacent the electrical generating means; a first belt-driven means operatively connected to the electrical generating means, first driving belt means operatively connected between the first belt-driven means and the starter ring gear such that the electrical generator means is mechanically powered by the engine; belt driving means operatively connected to the first belt-driven means; second belt-driven means operatively secured to the refrigerant compressor; and second driving belt means operatively connected between the second belt driven means and the belt driving means whereby the mechanical power from the engine is indirectly used to drive the refrigerant compressor.

4,399,666

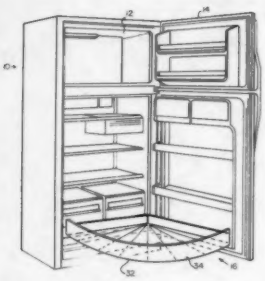
REFRIGERATOR COLD AIR RETAINING DEVICE

Eric M. Sakutori, 381 Waiehu Beach Rd., Wailuku, Hi. 96793

Filed Nov. 9, 1981, Ser. No. 319,739

Int. Cl.³ F25D *23/02*

U.S. Cl. 62—265 **5 Claims**



1. An apparatus for cooperation with an upright freezer or refrigerator, having an interior chamber with a frame defining an opening and a door for closing the opening, which comprises:

a flexible imperforate generally planar pie shaped cold air retainer having first and second generally rectilinear sides converging to an apex and a generally arcuate third side;

means for securing said retainer to said frame and the door of the associated freezer or refrigerator with said generally planar surface disposed in substantially horizontal relationship; and

said apparatus further including an upstanding peripheral flange disposed about said arcuate side of said retainer.

4,399,667

APPARATUS FOR CHILLING A PLURALITY OF FOOD TRAYS

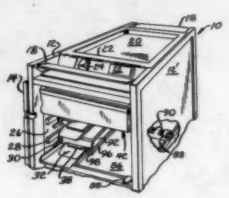
Richard C. Lamb, Southington, Conn., assignor to UOP Inc., Des Plaines, Ill.

Filed Jun. 1, 1982, Ser. No. 383,423

Int. Cl.³ F25D *25/02*

U.S. Cl. 62—382 **11 Claims**

1. Apparatus for chilling an enclosed interior portion of a food service cart which has opposed end walls, at least one of which is a door, and a plurality of sets of opposed short shelves or ledges on its side walls which are adapted to receive the opposed edges of a plurality of meal trays, said apparatus comprising a tray-like bunker member having insulated side and bottom wall portions which are adapted to be slidably received on, and supported by, the uppermost of said sets of opposed shelves, said bunker member having a generally flat interior bottom surface which is periodically interrupted by a plurality of spaced grooves or channels which are arranged in a direction parallel to said side walls, said bunker member being adapted to receive pieces of dry ice or other cooling material on said flat bottom surface, said bunker member having an air flow turning surface and a chilled air discharge opening through its bottom wall at a first or downstream end thereof, said turning surface and said discharge opening being positioned so as to receive air which is blown over and around



said cooling material as well as air which is blown through said grooves or channels under said cooling material, said discharge opening being adapted to cooperate with a first end wall of said food service cart to direct air downwardly over said first end wall which has previously known drawn upwardly over the opposite end wall of the food service cart and forced over, under and around the cooling material by a blower element mounted in the cart near the opposite end of the bunker member.

4,399,668

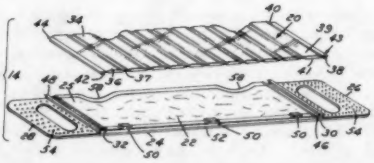
INDIVIDUAL BEVERAGE COOLER

Alma J. Williamson, 28167 E. Duluth, Mt. Clemens, Mich. 48045

Filed Sep. 17, 1981, Ser. No. 303,113

Int. Cl.³ F25D *3/08*

U.S. Cl. 62—457 **5 Claims**



1. A covering for a beverage container, comprising, in combination:

a flexible multilayer wrapped adapted to encircle a beverage container, conform to the essential shape of the container, and leave an opening at its top to expose the pouring end thereof;

said wrapper having an inner coolant layer externally surrounded by an insulative layer which in turn is externally surrounded by a protective layer;

handles at opposite ends of the wrapper which are matable when the wrapper is covering a beverage container; and

means for securing the aforesaid multilayer wrapper in wrapped relation about the container.

4,399,669

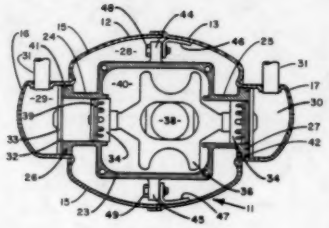
MOTOR COMPRESSOR UNIT

John J. Jacobs, Pulaski, N.Y., assignor to Carrier Corporation, Syracuse, N.Y.

Continuation of Ser. No. 7,867, Jan. 29, 1979, abandoned. This application Mar. 12, 1981, Ser. No. 242,855

Int. Cl.³ F25B 43/02

U.S. Cl. 62—469 4 Claims



1. A motor-compressor unit comprising:

a shell including a central head portion, a generally cylindrical left ear portion extending outward from a lower left area of the head portion, and a generally cylindrical right ear portion extending outward from a lower right area of the head portion, opposite the left ear portion;

a compressor located within the shell to compress a vapor; and

a motor supported by the compressor within the shell and connected to the compressor to drive the compressor;

the compressor including

a central body located within the head portion of the shell,

a left cylinder portion axially extending outward from the central body of the compressor into the left ear portion of the shell, along a horizontal axis defined by the left cylinder portion,

a left support flange extending vertically outward from the left cylinder portion of the compressor, within the left ear portion of the shell,

a right cylinder portion axially extending outward from the central body of the compressor into the right ear portion of the shell, co-axial with and opposite from the left cylinder portion of the compressor, and

a right support flange extending vertically outward from the right cylinder portion of the compressor, within the right ear portion of the shell;

wherein the left and right support flanges separate the interior of the shell into a central region and separate left and right, opposed peripheral regions, and cooperate with interior surfaces of the left and right ear portions of the shell to support the compressor and the motor therewithin.

4,399,670

APPARATUS FOR TRANSFERRING WEFT THREADS IN A WRAP KNITTING MACHINE

Gerhard Hittel, Rodgau; Hand Fiedler, and Hans Groh, both of Obertshausen, all of Fed. Rep. of Germany, assignors to Karl Mayer Textilmaschinenfabrik GmbH, Obertshausen, Fed. Rep. of Germany

Filed Apr. 6, 1982, Ser. No. 366,005

Claims priority, application Fed. Rep. of Germany, Apr. 9, 1981, 3114405

Int. Cl.³ D04B 23/06

U.S. Cl. 66—84 A 11 Claims

1. A warp knitting machine for providing a fabric having magazine weft threads, said machine having:

a plurality of needles;

at least one needle bar;

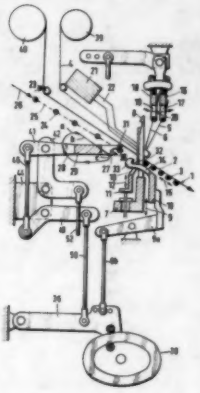
at least one guide bar;

a drive means for reciprocatingly actuating said needle bar; and a weft thread transfer means comprising:

a transport means for successively carrying said magazine weft threads toward said needle bar;

a knockover sinker bar mounted in said machine and operable to reciprocate therein; and

a plurality of knockover sinkers mounted on said knockover bar and reciprocatable therewith for periodically knocking over stitches formed by said needles, at least a



predetermined number of said knockover sinkers having:

gripping means passable between adjacent needles for gripping an adjacent one of said weft threads, said knockover sinker bar being movable upon a path between a first position in which the gripping means grips an adjacent one of the weft threads provided by said transport arrangement behind said needles, and a second position in which the gripping means bring said adjacent one of the weft threads into said needles.

4,399,671

GREEN-HOUSE CURTAIN

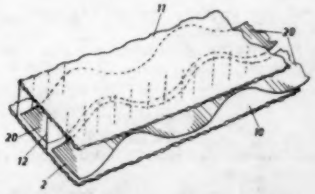
Göran Henningsson, Kinna, Sweden, assignor to Ludvig Svensson (Holland) B.V., Ede, Netherlands

Filed Nov. 4, 1980, Ser. No. 203,907

Claims priority, application Sweden, Nov. 19, 1979, 7909521; Feb. 28, 1980, 8001544

Int. Cl.³ D04B 7/04

U.S. Cl. 66—196 17 Claims



1. A rollable and drapeable green-house curtain comprising:

at least two fabric layers arranged in superposed spaced apart relation to the next adjacent layer and forming an air space therebetween;

a plurality of connecting members each comprised of at least one thin, flexible plastic thread each end of which being provided with cross locking members, said thread extending between and connected at the opposed ends thereof to each superposed adjacent fabric layer, said connecting

members being distributed over substantially the entire inner surfaces of the fabric layers and spaced apart by a distance greater than the lengths of said connecting members.

4,399,672

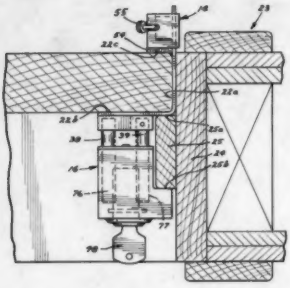
AUXILIARY SECURITY LOCK ASSEMBLY FOR A DOOR

John H. Moorhouse, Clear Lake, Minn. 55319

Filed Jul. 27, 1981, Ser. No. 286,780

Int. Cl.³ E05B 73/00; E05C 19/18

U.S. Cl. 70—101 **8 Claims**



1. An auxiliary security lock assembly for a door hung in a frame to secure the outer entry side of the door, having in combination

a horizontal vertically disposed rigid plate member,

one end portion of said plate member being extended longitudinally,

a door engaging holding member for said plate member,

said holding member having a slot therein to receive said extended end portion of said plate member,

said holding member having a chamber therein and having one side of said chamber open to said slot,

a rotatably movable member disposed within said chamber,

a projecting portion from said movable member extending through said open side into said slot to engage and secure therein said extended end portion of said plate member,

said projecting portion having a flat side to be flush with said open side of said chamber in one position of said movable member,

a laterally angled portion of said plate member at the other end portion thereof,

spaced lock engaging means extending outwardly from said angled portion,

pivot means securing at least one of said lock engaging means,

locking means receiving and securing therein said lock engaging means, and

a laterally projecting door frame engaging shoulder extending from said locking means.

4,399,673

LOCK DEVICE

Motohiro Gotanda, No. 1802-10,, Nakabyo, Abiko City, Chiba Prefecture, Japan

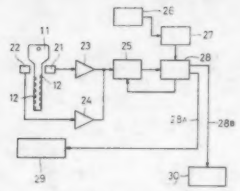
Filed Nov. 12, 1981, Ser. No. 320,589

Claims priority, application Japan, Nov. 22, 1980, 55-164049

Int. Cl.³ E05B 47/00

U.S. Cl. 70—276 **1 Claim**

1. A lock device comprising a fixed cylindrical member, a rotatable member fitted into said fixed member and rotated to cause a dead bolt to be reciprocated and having a key hole extending along the axial center line thereof, and a means for locking said fixed member to said rotatable member by a plurality of permanent magnets arranged according to a predetermined pole pattern, wherein said locking means can be released so as to enable the lock device to be locked and unlocked when a key having a plurality of permanent magnets embedded on both sides thereof according to the predetermined pole pattern is inserted into the key hole, said lock device being characterized by a fixable guide cylinder rotatably housed in said fixed member, an engaging means for fixing the fixed guide cylinder



to said fixed member and for releasing the fixed guide cylinder from said fixed member, a pattern reading means for detecting the pole pattern of said key, and a driving means, responsive to said pattern reading means, for driving said engaging means to fix said fixed guide cylinder to the fixed member, and to release said fixed guide cylinder from said fixed member only when the pole pattern read out by said pattern reading means coincides with a previously stored pole pattern.

4,399,674

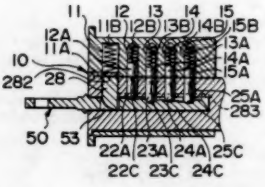
SELF-SHUT TYPE LOCK DEVICE

Kuo L. Tsai, 5, Lane 59, Chao Chou St., Taipei, Taiwan

Filed Aug. 25, 1980, Ser. No. 180,574

Int. Cl.³ E05B 15/14, 27/02

U.S. Cl. 70—364 A **7 Claims**



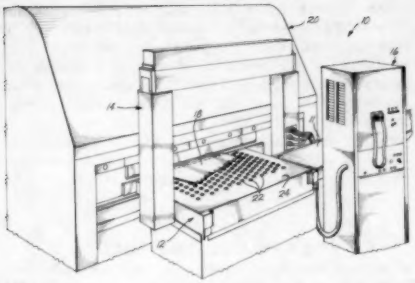
1. A self-shut type lock device comprising: a key, a lock body having a longitudinal central opening within which is rotatably mounted a cylinder, said cylinder providing a keyhole at its center and a plurality of lower tumbler-holes with respective lower tumbler segments extending from its outer circumference to said keyhole, on the inner circumference of said central opening of said lock body, with respect to the location of each said lower tumbler-holes, a plurality of upper tumbler-holes being cut extending into said lock body, in which a plurality of springs and upper tumbler segments are overslipped therein, a U-shaped groove being cut on the outer circumference of said cylinder at the location in front of said lower tumbler-holes, said U-shaped groove communicating with said keyhole, inside which a protecting means is overslipped therein for self-hiding the lower tumbler segments and preventing the same from being picked through said keyhole, said protecting means including a U-shaped configuration having two long stop arms for raising all lower tumbler segments to the correct height to prevent said cylinder from being rotated.

4,399,675

APPARATUS AND METHOD FOR SHEET METAL PART ALIGNMENT

Joachim C. Erdmann, Seattle, Wash.; Robert I. Gellert, Quesnel, Canada, and Jan Jeppsson, Bellevue, Wash., assignors to The Boeing Company, Seattle, Wash.

Filed Oct. 29, 1981, Ser. No. 316,390
Int. Cl.³ B21C 51/00
U.S. Cl. 72—37 21 Claims



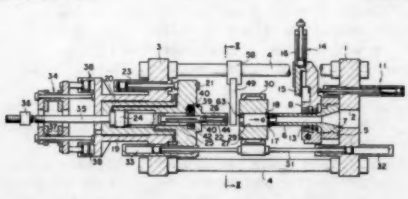
1. An apparatus for automatically aligning a sheet metal work piece to a press brake, with the apparatus comprising: a plurality of wheels in a dense grid pattern protruding slightly through the top surface of an alignment area; means for selectively swiveling the wheels from an X through a Y direction; a series of driven disks in a first half of the alignment area to be contacted at the extreme wheel positions to drive the wheels in that alignment area; a series of driven disks in a second half of the alignment area to be contacted at the extreme wheel positions to drive the wheels in that alignment area; optical means for measuring a sheet metal work piece location with respect to a press brake, in the first half of the alignment area and for directing drive movement at that area; and optical means for measuring the sheet metal work piece location, with respect to the press brake, in the second half of the alignment area and for directing drive movement in that area to locate a bend line of the sheet metal work piece with respect to the press brake.

4,399,676

MANDREL CLEANING DEVICE FOR EXTRUSION PRESS

Tatsuhiko Noyori; Masakazu Ueda, both of Kobe; Masanobu Aoki; Takashi Kajima, both of Shimonoseki, and Tsuneharu Masuda, Kobe, all of Japan, assignors to Kabushiki Kaisha Kobe Seiko Sho, Kobe, Japan

Filed May 26, 1981, Ser. No. 267,243
Claims priority, application Japan, May 24, 1980, 55-70445; May 24, 1980, 55-72792
Int. Cl.³ B21C 35/06, 25/04
U.S. Cl. 72—40 3 Claims



1. A mandrel cleaning device for an extrusion press including a pressurizing stem for pressing a billet in a container toward a die and a mandrel axially slidable in and relative to said pressurizing stem for determining the internal shape of a hollow extruding material, comprising:

rotary drive means for rotating said mandrel about the axis thereof;

grinder means for grinding an exterior tip portion at the fore end of said mandrel simultaneously with rotation of said mandrel by said rotary driven means; and

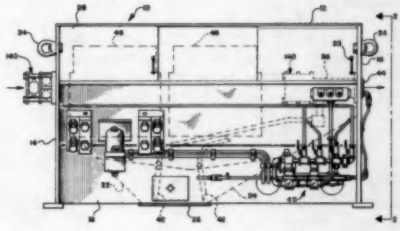
transfer means for selectively moving said grinder means toward and away from said mandrel.

4,399,677

APPARATUS FOR MECHANICAL DESCALING OF STEEL WIRE

Harry S. Price, III, Spring Valley, and Frank W. Brooks, Dayton, both of Ohio, assignors to Flexiblast Company, Wilmington, Ohio

Filed Nov. 9, 1981, Ser. No. 319,822
Int. Cl.³ B21B 45/04; B21C 43/04; B21D 3/02
U.S. Cl. 72—40 18 Claims



1. An apparatus for descaling steel wire, comprising:

a housing through which wire to be descaled can pass;

a first set of rollers mounted for rotation within the housing and about which wire to be descaled passes and is bent in a first plane;

a second set of rollers mounted for rotation within the housing and disposed downstream in the direction of movement of the wire from the first set of rollers and about which the wire is bent in a second plane perpendicular to the first plane;

each set of rollers having two pairs of breaker rollers and a center roller disposed between the pairs of breaker rollers;

means mounting the pairs of rollers on opposite sides of the wire for pivotal movement about an axis perpendicular to the wire;

means for pivoting the means mounting the pairs of rollers into predetermined positions relative to the diameter of the wire for bending the wire a predetermined amount; and

means mounting the center rollers for movement between a position out of engagement with the wire and an adjustable position engaging the wire and bending it a predetermined amount in relation to the diameter of the wire.

4,399,678

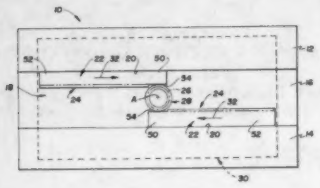
RACK FOR SPLINING THIN-WALL SLEEVES OF POWER TRANSMISSION MEMBERS

James T. Killop, Warren, Mich., assignor to Anderson-Cook, Inc., Fraser, Mich.

Filed Mar. 2, 1981, Ser. No. 239,264
Int. Cl.³ B21D 9/14
U.S. Cl. 72—88 7 Claims

1. In apparatus including a toothed rack and a toothed man-

drel for forming splines in a thin-wall sleeve of a power transmission member by meshing of the rack and the toothed mandrel with the sleeve therebetween to form splines therein, said rack comprising: a toothed forming face including teeth that are spaced from the toothed mandrel during meshing thereof with the thin-wall sleeve located therebetween; said toothed forming face having a pitch line and including leading and trailing tooth groups along the pitch line; each tooth group having teeth spaced along the pitch line for a distance equal to



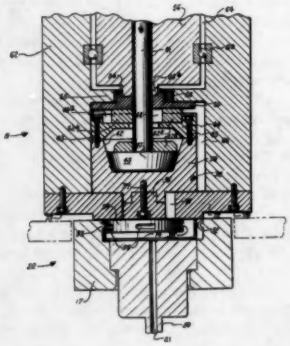
at least half the circumference of the mandrel; the teeth within each tooth group having the same profile as each other and being positioned with respect to the pitch line in a uniform relationship; the teeth of the leading tooth group having a greater tooth thickness along the pitch line than the tooth thickness along the pitch line of the teeth of the trailing tooth group; and the teeth of the trailing tooth group having an addendum of a greater height than the teeth of the leading tooth group.

4,399,679

METHOD AND APPARATUS FOR THREADING CLOSURES

Roderick V. King, Girard, Pa., assignor to Ethyl Products Company, Richmond, Va.

Filed Nov. 2, 1981, Ser. No. 317,069
Int. Cl.³ B21D *51/50*
U.S. Cl. 72—117 **8 Claims**



1. An apparatus for forming a thread about the sidewall of a closure, said apparatus comprising:

a. a nest for holding said closure, said nest having a circular sidewall circumventing the closure sidewall, said circular sidewall carrying first thread die means about its circumference;

b. circular tool means, having a diameter smaller than the diameter of said closure sidewall and having about its circumference second die means for coaction with said first die means to form said thread about said closure sidewall, said circular tool means being movable to,

(i) a first position above said closure and coaxially aligned with the center axis of said closure,

(ii) a second position into the interior of said closure and coaxially aligned with the center axis of said closure, and

(iii) a third position laterally displaced from said second position so that said circular tool means is against said closure sidewall whereby said first and second die means are set for coaction;

c. first power means associated with said circular tool means for moving said circular tool means from said first position to said second position and from said second to said first position;

d. second powered means for moving said circular tool means from said second position to said third position and from said third position to said second position;

e. powered orbital means for moving said circular tool means in an orbital path about the center axis of said closure when at least said circular tool means is in said third position; and

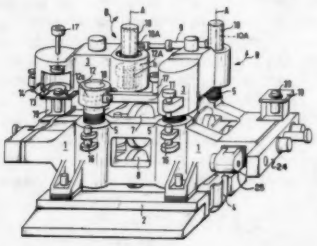
f. powered rotational means for rotating said circular tool means as said circular tool means moves in said orbital path.

4,399,680

UNIVERSAL ROLLING MILL

Hans-Heinrich Hartmann, Meerbusch, and Alexandr Svagr, Hilden, both of Fed. Rep. of Germany, assignors to SMS Schloemann-Siemag Aktiengesellschaft, Dusseldorf, Fed. Rep. of Germany

Filed Jul. 15, 1981, Ser. No. 283,425
Claims priority, application Fed. Rep. of Germany, Oct. 17, 1980, 3039203
Int. Cl.³ B21B *31/14, 13/10*
U.S. Cl. 72—225 **7 Claims**



1. A universal rolling mill comprising:

a pair of horizontal roll assemblies each including bearing chock assemblies for rotatable support thereof,

a pair of vertical roll assemblies each including a bearing chock assembly for rotatable support thereof,

a frame to carry said horizontal roll assemblies and said vertical roll assemblies with the rotational axis of each roll lying substantially within a common vertical plane which is generally perpendicular to a passline for a workpiece passed between said rolls, said frame including yoke sections for supporting said vertical roll assemblies,

an adjustment spindle for each of said yoke sections to position said vertical roll assemblies in said frame,

pairs of upper and lower crossheads for supporting said horizontal roll assemblies,

spindles retained against axial displacement by said frame to rotate for adjustably positioning said crossheads relative to said frame,

pivotal support means interconnecting one of said spindles engaged with each crosshead of the upper pair thereof, said pivotal support means including nut members having threads engaged with the spindle, said threads being constructed to elevate the crosshead during swinging movement of the crosshead to one side of said passline relative to said frame,

nut assemblies including nut housings on each of said spindles to engage with one of the crossheads of the upper pair thereof, and

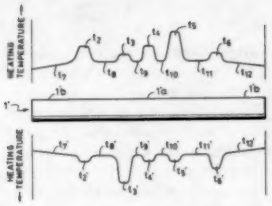
tie means to interconnect said nut housings.

4,399,681

FORGING OF AN ARTICLE HAVING A PLURALITY OF LONGITUDINALLY ARRANGED PROTUBERANCES

Hiroshi Hatsuno, Higashi-Matsuyama, Japan, assignor to Diesel Kiki Co., Ltd., Tokyo, Japan

Filed Feb. 3, 1981, Ser. No. 231,132
Claims priority, application Japan, Feb. 27, 1980, 55-23759
Int. Cl.³ B21K 1/12
U.S. Cl. 72—342 **5 Claims**



1. A method of manufacturing by forging an elongated article having a plurality of protuberances, said protuberances being enlarged radially outwardly, and integrally formed on an outer peripheral surface of said article in a longitudinal arrangement, the method comprising:

(a) heating an elongated blank of a metal or an alloy thereof such that the blank has a plurality of protuberance-forming portions thereof heated to respective predetermined termperatures higher than the other portions thereof;

(b) then positioning a substantially whole portion of said blank thus heated into a forging die; and

(c) axially applying pressure to said heated blank at opposite ends thereof with said blank in a heated state in said forging die to cause same to be axially compressed such that said protuberance-forming portions are radially outwardly deformed only by said axial pressure application and protuberances are formed on the protuberance-forming portions of the outer peripheral surface of said blank;

(d) said heating step comprising heating said blank such that said respective predetermined heating temperatures for said protuberance-forming portions of said blank are proportionate, respectively, to the radial sizes of corresponding ones of said protuberance-forming portions of said blank which are protruded from the peripheral surface of said blank for formation of said protuberances in said step (c).

4,399,682

METHOD FOR COLD FORMING METAL ARTICLES HAVING DIVERGING MEMBERS

Kenneth P. Hackett, Nashville, Tenn., assignor to The Gleason Works, Rochester, N.Y.

Filed Apr. 24, 1981, Ser. No. 257,163
Int. Cl.³ B21D 22/06
U.S. Cl. 72—359 **9 Claims**

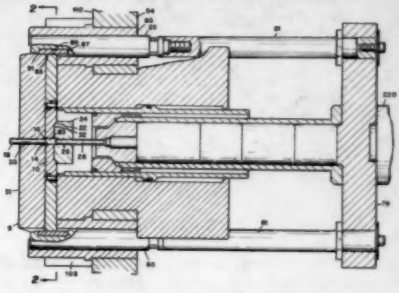
1. A method for cold extrusion of a metallic billet into an article having stationary divergent members employing a die cavity having a central portion and a diverging portion, in a single uninterrupted motion, comprising the steps of:

depositing said billet within said central portion of said die cavity;

hydraulically urging a first member into contact with a first end of said billet;

hydraulically urging a second member into contact with a second end of said billet, said first end being opposite from said second end;

simultaneously urging said first member and said second member toward one another at an equivalent forming



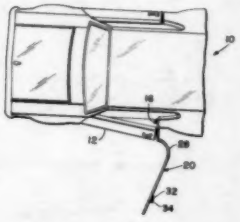
velocity until said billet has flowed to fill said stationary diverging portion, said forming velocity being between about 30% and about 60% of the normal forming velocity of about 450 inches per minute for the material comprising said billet.

4,399,683

VEHICLE DOOR ALIGNING TOOL

Theodore K. Hunter, 6305 Buena St., Atascadero, Calif. 93422

Filed Dec. 2, 1981, Ser. No. 326,487
Int. Cl.³ B21D 1/12
U.S. Cl. 72—458 **8 Claims**



1. Apparatus for aligning an associated vehicle door with the cooperating portions of an associated vehicle body which comprises:

a lever,

means carried at a first axial location on said lever for engaging a lock pin on the door jamb of the associated vehicle body, and

means carried on said lever at a second axial location spaced from said first axial location for engaging an associated door lock of the associated door.

4,399,684

GAS MEASUREMENT METHOD

Gulu N. Advani, San Jose; Robert Beard, Placerville, and Leonard Nanis, Palo Alto, all of Calif., assignors to Sierra Monitor Corporation, Sunnyvale, Calif.

Filed Nov. 27, 1981, Ser. No. 325,262
Int. Cl.³ G01N 27/12
U.S. Cl. 73—1 G **5 Claims**

1. A method of operating a metal-oxide semiconductor gas sensor comprising,

(a.) calibrating a gas sensor by:

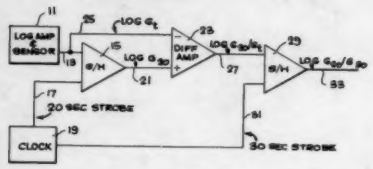
(1) exposing a metal-oxide gas sensor to a range of known

gas concentrations, said gas being of a type measurable by the sensor,

(2) thermally cycling the gas sensor for each gas concentration, the thermal cycle having a heating interval and a cooling interval,

(3) measuring and recording the ratio of sensor conductance at two times in the thermal cycle, then,

(b.) mesuring an unknown gas sample by:



(1) exposing the gas sensor to an unknown concentration of said particular gas while thermally cycling said gas sensor and measuring the ratio of sensor conductance at said two times in the thermal cycle,

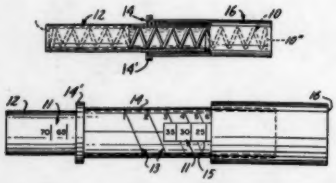
(2) determining the unknown gas concentration of said particular gas by comparing said ratio measured for the unknown concentration to the previously measured ratios for said gas concentrations in said range of concentrations.

4,399,685

FORCE AND KINETIC ENERGY MEASURING DEVICE

Richard E. Atkey, Memphis, Tenn., assignor to Dover Corporation, Memphis, Tenn.

Filed Feb. 9, 1981, Ser. No. 232,569
Int. Cl.³ G01L *1/04*
U.S. Cl. 73—11 **6 Claims**



1. A device for measuring both force and kinetic energy comprising:

a first cylindrical tube having one end closed and the other end open;

a calibrated spring positioned within the first tube and having one end adjacent the closed end of the tube, the other end of the spring extending beyond the open end of the first tube;

a second cylindrical tube having one end closed, an open end of the second tube sliding over the first tube and the other end of the spring being received within said second tube and positioned adjacent its closed end; and

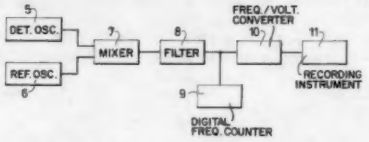
an indicator means positioned about said first cylindrical tube in such a manner that it is displaceable by contact with the open end of the second tube during compression of the spring by movement of the first tube within the second during the initiation of an impact of a particular mass with the device under the influence of a particular force, and remains on the first tube at the point of maximum displacement when the compression of the spring is at least somewhat relieved as it assumes a static position under the influence of the force.

4,399,686

GAS DETECTOR

Alf R. Kindlund, and Kurt I. Lundström, both of Linköping, Sweden, assignors to Engström Medical AB, Bromma, Sweden

Filed Feb. 5, 1981, Ser. No. 231,942
Claims priority, application Sweden, Feb. 21, 1980, 8001357
Int. Cl.³ G01N *31/06*
U.S. Cl. 73—23 **7 Claims**



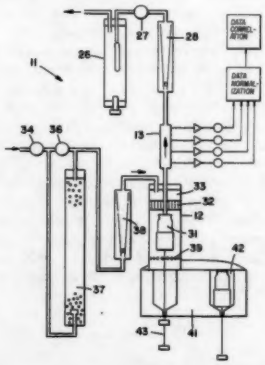
1. An apparatus for detecting the presence of anaesthetic gases selected from the group consisting of halothane, enfluorance, metoxyfluorane and isofluorane in a mixture of gases, comprising a thin layer of a substrate coated on the surface of a carrier body in such manner that the gas mixture can be brought into contact with the substrate layer, and means for measuring a physical property of said substrate layer which is affected by the amount of gaseous components being adsorbed by the substrate layer, said substrate layer comprising a silicone glycol copolymer.

4,399,687

APPARATUS FOR ANALYZING AND IDENTIFYING ODORANTS

Carter Collins, 2232 Webster St., San Francisco, Calif. 94115

Filed Dec. 23, 1980, Ser. No. 220,001
Int. Cl.³ G01N *31/06*
U.S. Cl. 73—23 **11 Claims**



1. An apparatus for detecting and identifying odorant substances, comprising: a detection chamber; means for delivering a charge of odorant-bearing gas into said chamber; a plurality of temperature sensing devices disposed in said chamber; a plurality of selectively adsorbing coating means, each disposed on one of a portion of said plurality of temperature sensing devices for adsorbing said odorant substances and utilizing the latent heat of fusion thereof and transferring said latent heat to the respective temperature sensing device; means for detecting a plurality of temperature differences between said portion of said plurality of temperature sensing devices and the remainder of said devices; means for normalizing said plurality of temperature differences with respect to the sum of said temperature differences; and means for correlating said normalized temperature differences with the selective adsorption characteristics

of known odorant substances to identify the odorant substances.

4,399,688

AIR POLLUTION DETECTION

William H. Dennis, Bartlesville, Okla., assignor to Phillips Phillips Petroleum, Bartlesville, Okla.

Filed May 18, 1981, Ser. No. 264,512

Int. Cl.³ G01N *1/22, 31/06*

U.S. Cl. 73—23.1 **12 Claims**

1. Apparatus for determining if at least one air pollutant is contained in air sampled at a first location, said apparatus comprising:

an adsorbing column located at said first location, wherein said adsorbing column contains an adsorbing material capable of adsorbing said at least one air pollutant;

means for passing air obtained from said first location through said adsorbing column for a first period of time;

means for passing a carrier fluid through said adsorbing column for a second period of time;

means for controlling the flow of said air and said carrier fluid to said adsorbing column in such a manner that said air and said carrier fluid are provided alternately to said adsorbing column;

means for desorbing said at least one pollutant, wherein said at least one pollutant is desorbed in a third period of time when said carrier fluid is flowing through said adsorbing column and wherein said third period of time is much less than said first period of time;

means for detecting the presence of said at least one air pollutant in a sample, wherein said means for detecting is located at a second location which is at least ten feet from said first location; and

conduit means for providing said carrier fluid to said means for detecting, wherein a concentrated sample of said at least one pollutant is introduced into said carrier fluid when said carrier fluid is passing through said adsorbing column and said at least one pollutant is desorbed so as to provide a concentrated sample of said at least one pollutant through said conduit means to said means for detecting.

4,399,689

TEMPERATURE-CONTROLLED SAMPLE CELL FOR PHOTOACOUSTIC SPECTROSCOPY

Paul S. Bechthold, Pulheim-Dansweiler, and Johann Chatzipetros, Frechen, both of Fed. Rep. of Germany, assignors to Kernforschungsanlage Jülich GmbH, Jülich, Fed. Rep. of Germany

Filed Mar. 4, 1981, Ser. No. 240,544

Claims priority, application Fed. Rep. of Germany, Mar. 6, 1980, 3008546

Int. Cl.³ G01N *29/00*

U.S. Cl. 73—24 **11 Claims**

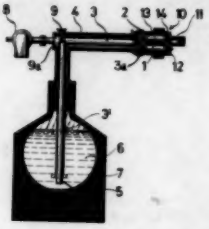
1. A temperature-controlled cell for photoacoustic spectroscopy comprising:

an elongated massive heat conductive member having one end immersible in a coolant and formed at the opposite end with a measuring chamber for receiving a sample;

means forming at least one window opening into said chamber for subjecting said sample to illumination;

a vacuum jacket surrounding said member;

a microphone chamber adapted to receive a microphone and communicating with said measuring chamber by a bend



tube affording acoustic coupling of said measuring chamber with said microphone chamber while minimizing heat conduction therebetween, said tube opening into said microphone chamber at a level above the level at which it opens into said measuring chamber; and

at least one heating coil on said opposite end of said member for varying the temperatures at which measurements are taken by said microphone of a sample in said chamber.

4,399,690

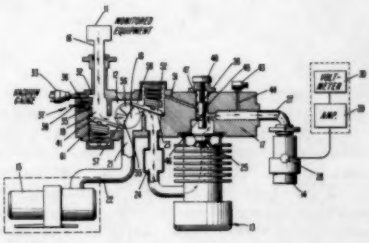
VACUUM LEAK DETECTOR HAVING SINGLE VALVE ASSEMBLY

Paul Fruzzetti, North Easton, Mass., assignor to Varian Associates, Inc., Palo Alto, Calif.

Continuation of Ser. No. 100,061, Dec. 4, 1979, abandoned. This application Dec. 28, 1981, Ser. No. 335,009

Int. Cl.³ G01M *3/20*

U.S. Cl. 73—40.7 **59 Claims**



1. In combination, equipment to be monitored for leaks of low molecular weight gas, such as helium, a mass spectrometer for monitoring the low molecular weight gas, a diffusion pump having a foreline and an inlet connected in fluid flow relation with the mass spectrometer, a three position valve assembly having ports respectively connected to an inlet conduit for receiving gas which may leak through equipment being tested to a roughing pump line and to the foreline, the assembly having: (1) a vent position wherein gas from the inlet conduit is blocked from the roughing pump line and the foreline so that the inlet conduit can be vented without having gas from the inlet conduit flow to the roughing pump line and the foreline, (2) a start position wherein gas from the inlet conduit flows to the roughing pump line while being blocked from the foreline, and (3) an operate position wherein gas from the inlet conduit flows to the roughing pump line and the low molecular weight gas flows from the inlet conduit to the mass spectrometer

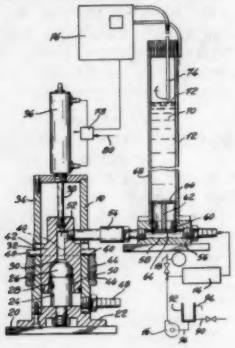
through the diffusion pump and gases of heavier molecular weight are substantially prevented by the diffusion pump from flowing from the inlet conduit to the mass spectrometer, the valve assembly having a single manually activated handle, means for mechanically coupling the handle to the valve assembly for sequentially mechanically activating the valve assembly to the vent, start and operate positions and for preventing direct activation of the valve assembly from the vent to operate positions to prevent compromising the vacuum of the diffusion pump.

4,399,691

SHIVE ANALYZER

Wladimir Janssen, 1024 Blvd. Demers, Carigan, Quebec, Canada J3L 1E9

Filed Jul. 27, 1981, Ser. No. 286,852
Int. Cl.³ G01N *15/06*
U.S. Cl. 73—63 **5 Claims**



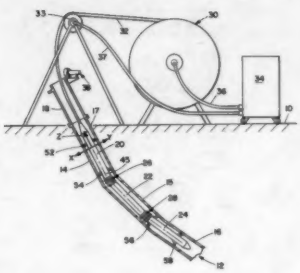
1. A shive analyzer comprising a closed chamber having a substantially conical outlet, a plug received within said conical outlet formed around a conical axis, said plug having a substantially spherical segment as its end facing into said outlet and concentric with and adapted to cooperate with said conical outlet to define an accurate annular outlet slot centred on said conical axis of said conical outlet, means to accurately adjust the relative positions of said spherical segment and said conical outlet along said conical axis thereby to adjust the width of said annular slot, said plug and said outlet being substantially free from relative radial movement with respect to one another and to said conical axis in order to maintain constant the relative position between said outlet and said spherical segment, opening means for rapidly relatively moving said conical outlet and said spherical segment along said conical axis to open said slot from a preset position to an open position and return said conical outlet and spherical segment to said preset position, a passage leading to said closed chamber, means to deliver a pulp at a substantially constant rate of flow through said passage into said closed chamber, means to sense a preset increase in the pressure in said passage, means to trigger said opening means to relatively move said conical outlet and said spherical segment to said open position and immediately thereafter return same to said preset position each time said preset increase in pressure is sensed and means to count the number of times such triggering action occurs.

4,399,692

BOREHOLE SURVEY APPARATUS UTILIZING ACCELEROMETERS AND PROBE JOINT MEASUREMENTS

Rand H. Hulsing, II, Redmond, and Rex B. Peters, Woodinville, both of Wash., assignors to Sundstrand Data Control Group, Redmond, Wash.

Filed Jan. 13, 1981, Ser. No. 224,789
Int. Cl.³ E21B *47/00*
U.S. Cl. 73—151 **35 Claims**



1. A borehole survey apparatus comprising:

a probe including a first probe section and a second probe section adapted for insertion and movement through a borehole and a joint assembly flexibly connecting said first probe section to said second probe section;

angle measurement means, operatively connected to said probe, for generating signals representing the angle between said second and said first probe sections at said joint assembly;

signal processing means, responsive to said angle signals, for generating signals representing the direction of the borehole;

means for generating an inclination signal representing the inclination of said first probe section from the verticle direction;

means for combining said angle signals and said inclination signal to generate signals representing the direction of the borehole inclination and azimuth; and

means for generating a signal representing the movement of said probe in the borehole and means responsive to said angle signals, said inclination signals and said movement signals for generating a signal representing the depth of the borehole.

4,399,693

APPLICATIONS OF BOREHOLE GRAVIMETRIC TECHNIQUES TO DETERMINE RESIDUAL OIL SATURATION

Luke S. Gournay, Rockwall, Tex., assignor to Mobil Oil Corporation, New York, N.Y.

Filed Jan. 8, 1982, Ser. No. 338,400
Int. Cl.³ G01V *1/40*
U.S. Cl. 73—152 **5 Claims**

1. A method of determining residual oil saturation of an oil bearing formation comprising:

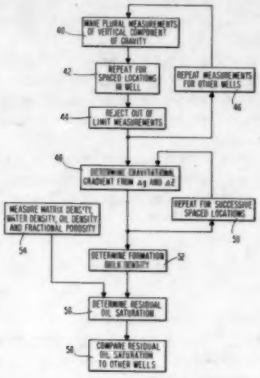
traversing a borehole with a gravimetric logging tool;

mesuring the earth's gravity at spaced locations in said borehole;

determining the gravitational gradient of the formation by comparison of said measurements of the earth's gravity at successive ones of said locations;

determining the formation bulk density from the variation in the gravitational gradient at said successively spaced locations and from the vertical distance between the successive spaced locations;

measuring the matrix density, water density, oil density, and fractional porosity of the formation; and



determining the residual oil saturation from the previously determined bulk density and from the measured matrix density, water density, oil density and fractional porosity.

4,399,694

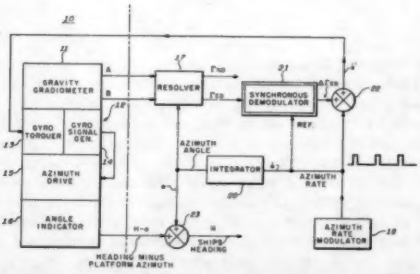
GRAVITY GRADIOMETER COMPASS

Arthur Mayer, Kew Gardens, N.Y., assignor to Sperry Corporation, New York, N.Y.

Filed Dec. 4, 1980, Ser. No. 213,137

Int. Cl.³ G01C *19/38*

U.S. Cl. 73—178 R **6 Claims**



1. In a vehicular mounted gravity gradiometer system of the type having a gravity gradiometer which is disposed upon a gyroscopically stabilized platform and which is slewed through an angle α in response to a modified signal of an azimuth rate modulator means, a compass comprising:

(a) means for resolving the output of said gradiometer into at least the gradient Γ_{ED};

(b) means for synchronously demodulating the gradient Γ_{ED}, to develop a signal proportional to $\Delta\Gamma_{ED}$;

(c) means for summing $\Delta\Gamma_{ED}$ with the output of said azimuth rate modulator means to produce the modified slewing signal;

(d) means for integrating the output of said azimuth rate modulator to determine α;

(e) means for indicating the angular rotation of said stabilized platform relative to the vehicle; and

(f) means for summing the output of said integrating means with the output of said angular rotation indicating means to provide a vehicular heading.

4,399,695

UNDERWATER SENSING MECHANISM AND METHOD

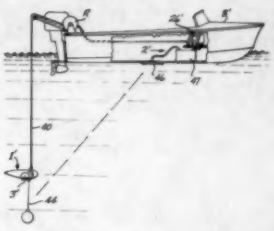
Ralph B. Peyton, 18511-67th West, Lynnwood, Wash. 98036

Continuation-in-part of Ser. No. 120,841, Feb. 12, 1980, Pat. No. 4,324,135, which is a continuation-in-part of Ser. No. 28,004, Apr. 9, 1979, abandoned. This application Oct. 26, 1981, Ser. No. 315,089

The portion of the term of this patent subsequent to Apr. 13, 1999, has been disclaimed.

Int. Cl.³ G01C *21/10*

U.S. Cl. 73—185 **25 Claims**



2. The process defined in claim 1, including actuating a display of the average speed detected by the water speed sensor over a predetermined period.

4,399,696

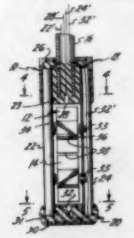
FLOW SENSOR PROBES

Murray F. Feller, Citrus County, Fla., assignor to Wilgood Corporation, Dunnellon, Fla.

Continuation-in-part of Ser. No. 31,416, Apr. 19, 1979, abandoned, and a continuation-in-part of Ser. No. 150,142, Jun. 18, 1980, Pat. No. 4,333,354. This application Dec. 11, 1980, Ser. No. 215,524

Int. Cl.³ G01F *1/10, 1/64*

U.S. Cl. 73—195 **18 Claims**

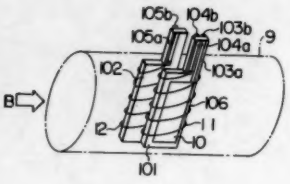


1. A flow sensor, including a conduit, at least one pair of independently rotatable multiple-blade rotors mounted in the conduit for independent rotation about parallel axes displaced equally from the axis of the conduit, the blades of any pair of rotors being arranged to cause mutually opposite directions of flow-activated rotation of the rotors about the axes thereof, and rotation sensors adjacent said rotors, respectively.

4,399,697
GAS FLOW MEASURING APPARATUS

Tokio Kohama, Nishio; Hideki Obayashi, Okazaki; Hisasi Kawai, Toyohashi, and Tsuneyuki Egami, Aichi, all of Japan, assignors to Nippon Soken, Inc., Nishio, Japan

Filed Mar. 24, 1981, Ser. No. 247,114
Claims priority, application Japan, Mar. 26, 1980, 55-39541; Jul. 28, 1980, 55-104047
Int. Cl.³ G01F *1/68*
U.S. Cl. 73—204 14 Claims

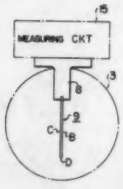


1. A gas flow measuring apparatus comprising:
a flow measuring tube through which gas to be measured flows;
a first support member made of electrical insulating material provided in said flow measuring tube;
an electrical heater resistive film member which is deposited on said first supporting member;
an electrical insulating material covering said electrical heater resistive member and consisting of a thin, insulating layer;
a first temperature dependent resistive means provided on said electrical insulating material covering said electric heater resistive member;
a second support member made of electrical insulating material disposed at a location little influenced by the heat from said electrical heater resistive member;
a second temperature dependent resistive member wound around said second support member; and
a measuring circuit which applies voltage to said electrical heater resistive member, and said first and second temperature dependent resistive members for measuring a flow rate of said gas.

4,399,698
GAS FLOW MEASURING APPARATUS

Syunichiro Hiromasa; Norio Omori, both of Kariya; Yutaka Kawashima, Okazaki, and Yukio Muto, Oobu, all of Japan, assignors to Nippondenso Co., Ltd., Kariya, Japan

Filed May 15, 1981, Ser. No. 264,208
Claims priority, application Japan, May 16, 1980, 55/65569
Int. Cl.³ G01F *1/68;* G01M *15/00*
U.S. Cl. 73—204 6 Claims

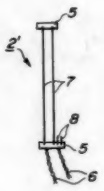


1. In a gas flow measuring apparatus including:
a gas flow measuring tube through which gas to be measured flows;
an electric heater provided in said gas flow measuring tube;
a first temperature dependent resistor provided in said gas flow measuring tube down-stream of said electric heater;
a second temperature dependent resistor provided in said gas flow measuring tube at a position where there is substantially no thermal effect of said electric heater; and
a measuring circuit using signals from said first and second temperature dependent resistors, for measuring the amount of flow of gas to be measured, the improvement comprising:
a base plate of an electrically insulating material mounted in said gas flow measuring tube, on which said electric heater and first and second temperature dependent resistors are formed respectively by metal coatings deposited on said base plate, and
a T-shaped cross-section support member for supporting said base plate within said gas flow measuring tube such that the longitudinal dimension of said base plate is substantially parallel to the flow of gas within said tube.

4,399,699
ELECTROSTATIC TYPE FUEL MEASURING DEVICE

Takeshi Fujishiro, Yokosuka, Japan, assignor to Nissan Motor Co., Ltd., Yokohama, Japan

Filed Jul. 17, 1980, Ser. No. 169,677
Claims priority, application Japan, Jul. 23, 1979, 54-100575[U]
Int. Cl.³ G01F *23/26;* G08B *21/00*
U.S. Cl. 73—304 C 5 Claims



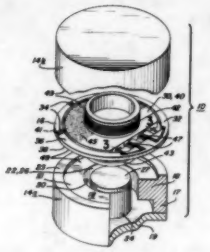
1. A method for measuring the amount of liquid fuel in a fuel tank with a device which includes a pair of measuring electrodes arranged relative each other to provide an electrostatic capacity therebetween which is related to the area of the measuring electrodes immersed in the tank and the height of fuel in the tank and thus representative of the amount of fuel in the tank; and at least a pair of spaced reference electrodes mounted in insulating means for maintaining said reference electrodes spaced ralative to said measuring electrodes in the fuel tank so that said reference electrodes are always wholly immersed in the fuel in the fuel tank, said reference electrodes being arranged relative to each other to provide an electrostatic capacity therebetween which is representative of the specific dielectric constant of the fuel, the method comprising the steps of:
sensing the electrostatic capacity between the reference electrodes immersed in the fuel;
sensing the electrostatic capacity between the measuring electrodes as a function of the surface area of the measuring electrodes, the specific dielectric constant of the air above the fuel level and the specific dielectric constant of the fuel; and
providing a pulsed output signal from an astable multivibrator which said signal has a first component representative of the sensed electrostatic capacity of said measuring electrodes and a second component representative of the sensed electrostatic capacity of said reference electrodes, whereby the frequency of the pulsed output signal is respectively determined as a representative of the electrical capacity of both said measuring electrode and said reference electrodes.

4,399,700

FORCE TRANSDUCER FLEXURE WITH CONDUCTORS ON SURFACES IN THE NEUTRAL BENDING PLANE

Richard A. Hanson, Woodinville, Wash., assignor to Sundstrand Data Control, Inc., Redmond, Wash.

Filed Jul. 14, 1981, Ser. No. 283,340
Int. Cl.³ G01P 15/13
U.S. Cl. 73—517 B 49 Claims



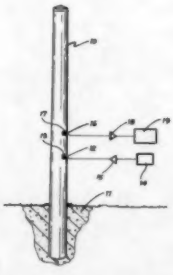
1. A force measuring transducer comprising:
a mounting base;
a force sensitive member including an electrical element;
a flexible member having one end secured to said mounting base and other end secured to said force sensitive member; and
an electrically conductive material disposed on said flexible member and extending between said electrical element and said mounting base wherein at least a planar portion of said electrically conductive material is disposed on a portion of said flexible member and the portion of said flexible member is in substantial alignment with the neutral bending axis of said flexible member.

4,399,701

METHOD AND MEANS FOR DETECTING DECAY IN WOOD

John I. Dunlop, Centennial Park, Australia, assignor to Unisearch Limited, Kensington, Australia

Filed May 29, 1981, Ser. No. 268,181
Claims priority, application Australia, Jun. 3, 1980, PE3858
Int. Cl.³ G01N 29/00, 24/00
U.S. Cl. 73—579 8 Claims



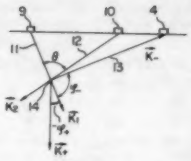
1. A method of detecting degradation in wood articles comprising the steps of applying acoustic waves along the wood grain, and measuring the band widths and frequencies of the acoustic or standing wave resonances in said articles as the frequency of said waves is varied over a predetermined range.

4,399,702

METHOD OF MEASURING STRESS DISTRIBUTION IN A SOLID BODY

Katsumichi Suzuki, Mito, Japan, assignor to Hitachi, Ltd., Tokyo, Japan

Filed Nov. 24, 1981, Ser. No. 324,443
Claims priority, application Japan, Nov. 25, 1980, 55/164604
Int. Cl.³ G01N 29/00, 24/04; G01H 5/00
U.S. Cl. 73—597 1 Claim



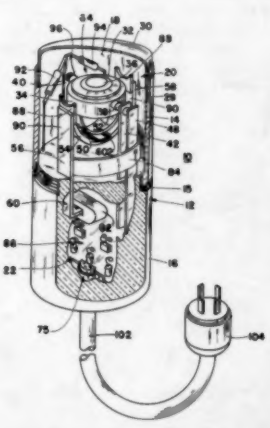
1. A method of measuring stress distribution comprising the steps of:
emitting two ultrasonic waves of different frequencies into a body under consideration from different locations on a surface of the body;
receiving a scattered wave created at a scattering point in the body by the interaction between the two ultrasonic waves;
causing the emitting locations of the ultrasonic waves and the receiving location of the scattered wave to scan; and
measuring the stress distribution in the body on the basis of the received outputs resulting from the scanning.

4,399,703

ULTRASONIC TRANSDUCER AND INTEGRAL DRIVE CIRCUIT THEREFOR

Terrance Matzuk, Pittsburgh, Pa., assignor to Dymax Corporation, Pittsburgh, Pa.

Filed Oct. 16, 1980, Ser. No. 197,596
Int. Cl.³ G01N 29/04
U.S. Cl. 73—621 24 Claims



1. An ultrasonic transducer for use in an ultrasonic scanning system that examines a specimen and creates an image of a portion of the specimen comprising:
a housing;
an ultrasonic transducer element disposed within said housing for generating ultrasonic waves in response to electrical signals received by said transducer element, for direct-

ing said waves toward the specimen, and for converting to a series of electrical signals ultrasonic waves reflected from within the specimen;

motion producing means disposed within said housing for causing said transducer element to oscillate between at least two positions, said motion producing means including means for applying force to move said transducer element in one of two directions, said force applying means including first magnet means fixed to said transducer element for creating a first magnetic field and second magnet means disposed within said housing for creating a second magnetic field, said second magnetic field interacting with said first magnetic field, at least one said magnet means being an electromagnet, the direction of said applied force depending upon which control signal of a set of control signals is applied to said force applying means, and further including means for generating said control signals and applying a said control signal to said force applying means, said control signal generating means including switch means for generating a switching signal to cause said control signal generating means to switch said applied control signal each time said transducer element reaches a said position, and further including a drive circuit for receiving said switching signals, for applying a control signal to the coil of said electromagnet, and for switching the control signal applied to said electromagnet each time said drive circuit receives a switching signal;

means for generating an electrical signal related to the position of said transducer element from which the image creating apparatus of the scanning system can coordinate image creation with movement of said transducer element; and,

a liquid disposed within said housing which transmits ultrasonic waves and which reduces the variation in the velocity at which said transducer element is moved from one said position to the other said position.

4,399,704

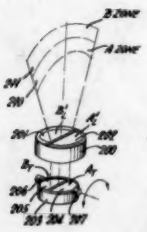
ULTRASOUND SCANNER HAVING COMPOUND TRANSCEIVER FOR MULTIPLE OPTIMAL FOCUS

Bayard Gardineer, Skillman, N.J.; Reuben S. Mezrich, Miami, Fla., and George W. Leber, Delran, N.J., assignors to Technicare Corporation, Solon, Ohio

Filed Jun. 3, 1981, Ser. No. 270,049

Int. Cl.³ G01N *29/00*

U.S. Cl. 73—642 **8 Claims**



1. In an ultrasound image system, the improvement comprising:

transducer means of generally circular shape and having at least two sector shaped transducer components, each said component being separately operable to transmit and receive sonic energy for imaging; and

means associated with said transducer means having respective sector shaped focusing segments for focusing energy from said respective transducer components into respective different predetermined focal zones.

4,399,705

ACCELERATION DETECTOR

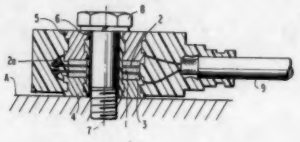
Günter Weiger, Esslingen; Paul Schwerdt, Freudenstadt, and Alfred Ziegenberg, Villingen-Schwenningen, all of Fed. Rep. of Germany, assignors to Daimler-Benz Aktiengesellschaft, Stuttgart, Fed. Rep. of Germany

Filed Oct. 1, 1981, Ser. No. 307,581

Claims priority, application Fed. Rep. of Germany, Oct. 7, 1980, 3037835

Int. Cl.³ G01P *15/08, 15/09;* G01L *23/22*

U.S. Cl. 73—654 **4 Claims**



1. A detector means for detecting vibrations, the detector means comprising a housing means having a cable outlet means for accommodating connecting leads of a connecting cable means; the cable outlet means being arranged at a right angle with respect to a main direction of vibration to be detected; connecting means are provided for connecting the leads of the cable means with the detector means; said connecting means are disposed on a side of the detector means opposite to the cable outlet means with respect to an axis of symmetry of the detecting means parallel to said direction of vibration; and mass means are provided on the side of the detector means at which the connecting means are disposed for forming with the connecting means a counter mass for the cable means.

4,399,706

PRESSURE INDICATOR FOR MEASUREMENT OF HOT PRESSURE MEDIUMS

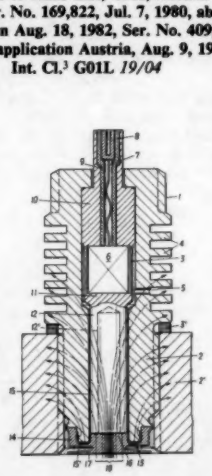
Helmut List; Peter Claassen, and Rudolf Zeiringer, all of Graz, Austria, assignors to Hans List, Graz, Austria

Continuation of Ser. No. 169,822, Jul. 7, 1980, abandoned. This application Aug. 18, 1982, Ser. No. 409,081

Claims priority, application Austria, Aug. 9, 1979, 5449/79

Int. Cl.³ G01L *19/04*

U.S. Cl. 73—708 **11 Claims**



1. A pressure indicator for measuring hot pressure media during combustion processes, comprising an indicator housing inserted within an opening of a cooled enclosure for the medium to be measured, a temperature-sensitive pressure measuring element disposed within said housing, a power train comprising a diaphragm of heat conductive material connected to an inner end of said housing and a power transmission element

interconnecting said diaphragm with said measuring element, said diaphragm and said transmission element having abutting flat surfaces establishing a direct heat conducting interconnection therebetween, said power transmission element being, at least adjacent said diaphragm, of heat conductive material, and a narrow gap defined between at least one of the parts of said power train and a portion of said housing lying adjacent thereto, said portion of said housing being substantially in heat conducting connection with said enclosure, whereby the region of said housing containing said measuring element is maintained at a suitably low temperature, without the need for external cooling, as heat is conducted via said gap to said housing which is directly cooled by said enclosure.

4,399,707

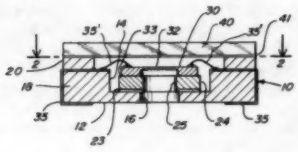
STRESS SENSITIVE SEMICONDUCTOR UNIT AND HOUSING MEANS THEREFOR

David B. Wamstad, Roseville, Minn., assignor to Honeywell, Inc., Minneapolis, Minn.

Filed Feb. 4, 1981, Ser. No. 231,546

Int. Cl.³ G01L *9/06*

U.S. Cl. 73—727 **11 Claims**



1. A pressure transducer comprising:

(a) a transducer housing including a ceramic base member having a recessed portion with an aperture therethrough and a shoulder portion around the periphery of said recessed portion;

(b) a washer-like support member, having an outside diameter B, hermetically bonded on one face thereof to said base member with a central aperture in said support member being substantially in register with said aperture of said base member;

(c) a silicon die having a flat shape, a length C, and a central portion of substantially reduced thickness so that said die is flexed in response to a pressure differential applied thereacross, the ratio of said length C to said diameter B being approximately 0.85;

(d) means mounting said die to the other face of said support member, said mounting means functioning to hermetically seal said die to said support member and to position said portion of reduced thickness in register with said apertures; and

(e) a cover member hermetically sealed to said shoulder portion.

4,399,708

ORIFICE METER WITH ROTATABLE ISOLATION SEALING MEMBER

Davis A. Van Scoy, Simonton, Tex., assignor to Grove Valve and Regulator Company, Oakland, Calif.

Filed Dec. 24, 1981, Ser. No. 334,143

Int. Cl.³ G01F *1/42*

U.S. Cl. 73—861.61 **4 Claims**

1. An orifice meter comprising:

a body with a flow passageway therethrough;

means forming a rotary bearing surface in said body transverse to said passageway;

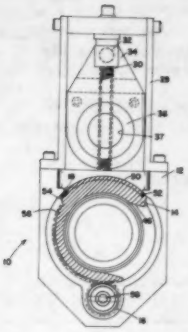
an annular member rotatable in said bearing surface;

an access opening from said bearing surface to the exterior of said body;

a complementary receptacle opening in one segment of said annular member;

sealing means in another segment of said annular member which, when aligned with said access opening, prevents leakage therethrough from said flow passage;

a gate-like orifice disc carrier;



means on said body operable to move said carrier between an active position extending through said receptacle opening in alignment with said flow passage and a servicing position outside of said body; and

means for rotating said annular member between active and servicing positions with, respectively, said receptacle opening and said sealing means in alignment with said access opening.

4,399,709

FLOW METER

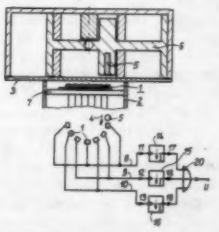
Rudolf Diepold-Scharnitzky, Berlin, Fed. Rep. of Germany, assignor to Siemens Aktiengesellschaft, Munich, Fed. Rep. of Germany

Filed Feb. 23, 1981, Ser. No. 237,517

Claims priority, application Fed. Rep. of Germany, Feb. 29, 1980, 3008248

Int. Cl.³ G01F *3/08*

U.S. Cl. 73—861.77 **9 Claims**



1. A flow meter comprising a piston rotatably mounted in the flow meter, at least one magnet carried by the piston, a measuring transducer arranged adjacent to the piston and comprising a plurality of magnetic field-sensitive components arranged in correspondence with the path of motion of the magnet carried by the piston so as to be sequentially sensitive to the field of the magnet as the piston rotates, each magnetic field-sensitive component being operative to generate a pulse as the magnet is carried past the respective magnetic field-sensitive component, non-adjacent magnetic field sensitive components being coupled together according to a predetermined order to arrange the magnetic field-sensitive components in groups, the predetermined order depending on the number of

groups, and an electric pulse edge-sensitive circuit coupled to each group of magnetic field-sensitive components for generating a pulse of relatively short duration in response to an edge of each pulse generated by the magnetic field-sensitive components.

4,399,710

METHOD OF AND DEVICE FOR THE REMOVAL OF BURDEN SAMPLES

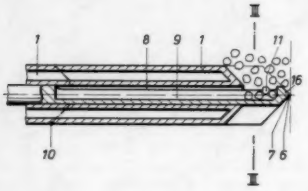
Werner Schneider, Siegen, Fed. Rep. of Germany, assignor to Dango & Dienenthal Maschinenbau GmbH, Siegen, Fed. Rep. of Germany

Filed Aug. 12, 1981, Ser. No. 292,240

Claims priority, application Fed. Rep. of Germany, Oct. 3, 1980, 3037400

Int. Cl.³ G01N *1/08*

U.S. Cl. 73—863.83 **6 Claims**



1. Device for removing samples from the burden in a furnace shaft comprising an elongated tubular lance insertable into the furnace shaft, said lance having a first end arranged to be inserted first into the furnace shaft and a second end arranged to be located outwardly from the furnace shaft, said lance having a length between the first end thereof and a point between the first end and the second end so that said lance can be inserted into the furnace shaft with the first end thereof the maximum possible distance inwardly from the inside of the furnace shaft, and an elongated sampler forming an elongated sampling trough slidably positioned within said tubular lance, said sampler having a first end positionable at the first end of said lance when said lance is in inserted into the furnace shaft with the first end thereof the maximum possible distance inwardly from the inside of the furnace shaft, said sampling trough in said sampler having a length from the first end thereof sufficient to receive a sample of the burden within the furnace shaft equal to the length between the first end of said lance and the point between the first end and the second end of said lance, said tubular lance and sampler independently slidably displaceable relative to one another so that said lance and sampler can be inserted as a unit through the furnace shaft wall into the burden in the furnace shaft until the leading first end of said lance is located at a sampling position spaced inwardly from the shaft wall and then retracting said lance toward the shaft wall relative to said sampler for exposing said sampling trough outwardly from the leading first end of said lance for removing samples from the burden and the lance can be withdrawn for completely uncovering said sampling trough within the furnace shaft or in a step-wise operation for uncovering only a partial length of said sampler and then retracting said sampler back into said lance.

4,399,711

METHOD AND APPARATUS ENSURING FULL VOLUME PICKUP IN AN AUTOMATED PIPETTE

Gerald L. Klein, Orange, Calif., assignor to Beckman Instruments, Inc., Fullerton, Calif.

Filed Apr. 18, 1980, Ser. No. 141,725

Int. Cl.³ G01N *1/10, 21/27*

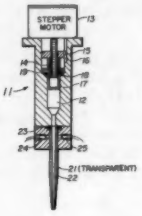
U.S. Cl. 73—864.16 **4 Claims**

1. A method for ensuring pickup and delivery of a desired volume of a liquid from a first container to a second container by an automated pipette structure having a tip portion mounted at the bottom thereof comprising the steps of:

drawing said desired volume of liquid plus a predetermined amount of excess liquid from said first container into the tip portion of said automated pipette by means of a piston selectively controlled in an automatic manner by means mounted on said automatic pipette structure;

retracting said automated pipette from said liquid in said first container;

intaking said drawn volume past an electromagnetic sensor;



sensing the continuity of said drawn volume by electromagnetically detecting the continued presence of said drawn volume as it is being intaken past said electromagnetic sensor mounted adjacent said tip portion;

automatically lowering said automated pipette into said first container;

returning said drawn volume to said tip portion of said automated pipette;

expelling a portion of said excess liquid concurrently with said step of returning; and

delivering said desired volume to said second container.

4,399,712

SEMI-AUTOMATIC ELECTRO-MECHANICAL PIPETTE WITH CONTROLLED TIP REMOVER

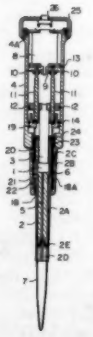
Yuji Oshikubo, Sakura, and Sadakazu Tanabe, Kawasaki, both of Japan, assignors to Nichiryo Co., Ltd., Tokyo, Japan

Filed Mar. 30, 1981, Ser. No. 249,094

Claims priority, application Japan, Feb. 9, 1981, 56-17670

Int. Cl.³ G01N *1/14*

U.S. Cl. 73—864.16 **6 Claims**



1. A pipette device capable of automatically sucking and discharging liquid and also capable of automatically removing a tip comprising: housing means, a tip frictionally fitted on a lower end of said housing means, a cylinder chamber defined in said housing means and communicating with an interior of said tip, plunging means slidably received in the cylinder chamber, a potentiometer for producing a signal representing

the position of said plunger means with respect to said cylinder chamber, plunger driving means including an electric motor and operably coupled with said plunger means for moving the same between at least three predetermined positions in accordance with said signal, said predetermined positions including a terminal sucking position, a terminal discharging position and a tip removing position, and a tip removing mechanism including a lower cylindrical member slidably mounted on the lower end of said housing means with a lower end of said cylindrical member being normally located against an upper end of said tip which is mounted on the lower end of said housing means and at least two rod members extending vertically in said housing means and being slidable relative thereto with said rod members having lower ends engaging with an upper end of said cylindrical member, and upper ends of said rod members being actuated by said plunger driving means when said plunger means moves from said terminal discharging position to said tip removing position, whereby the mounted tip is pressed downward by said lower cylindrical member and is removed from the pipette device.

4,399,713

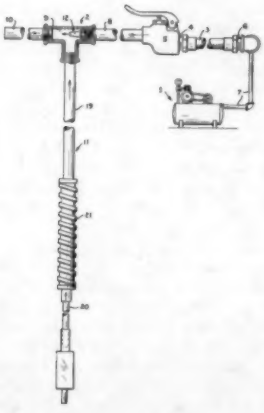
DEVICE FOR SAMPLING MOLTEN MATERIAL AND MEANS FOR OPERATING SAME

William J. Collins, 7005 Madison St., Merrillville, Ind. 46410

Filed Jun. 25, 1981, Ser. No. 277,198

Int. Cl.³ G01N *1/12*

U.S. Cl. 73—864.54 **27 Claims**



1. Structure for the purpose described comprising a pair of pipes, a coupling communicatively connecting said pipes together in an angular relationship, said coupling having a chamber and an outlet, one of said pipes having an extremity provided with means for supporting a device for receiving a sample of molten material from a supply thereof, and the other of said pipes having an end for connection with a source of air under pressure for causing the air to flow through said chamber and outlet in a manner whereby to cause air to be evacuated from said one pipe and thereby induce the flow of such a material into such a device.

4,399,714

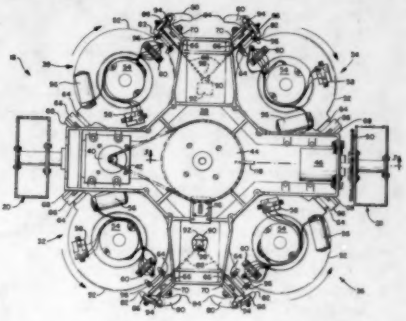
METHOD AND APPARATUS FOR OVERCOMING CERTAIN DESTABILIZING TORQUES ON GYRO-STABILIZED PLATFORMS

A. Clifford Barker, Newport News, Va., assignor to Navidyne Corporation, Newport News, Va.

Filed Nov. 9, 1981, Ser. No. 319,620

Int. Cl.³ G01C *19/26*

U.S. Cl. 74—5.1 **7 Claims**



1. In a gyro-stabilized apparatus of the type comprising a platform having a pair of gyros supported thereon for movement about parallel precessional axes and wherein the platform is capable of movement about a platform axis and the gyros have rotors with means for driving the rotors clockwise and counterclockwise, respectively, about spin axes that are normally parallel to the platform axis, the improvement comprising means for caging one or the other of said gyros when the platform moves about said platform axis, the gyro caged being that which has its rotor spinning in the direction opposite to the direction of movement of the platform about the platform axis.

4,399,715

POWER TAKE-OFF

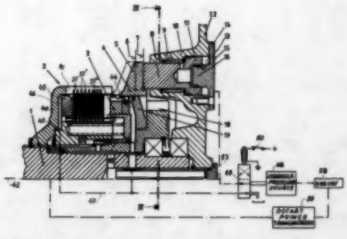
Peter Dziuba, Überlingen, and Herbert Simon, Friedrichshafen, both of Fed. Rep. of Germany, assignors to Zahnradfabrik Friedrichshafen AG, Friedrichshafen, Fed. Rep. of Germany

Filed Jun. 20, 1980, Ser. No. 161,384

Claims priority, application Fed. Rep. of Germany, Jun. 21, 1979, 2924939

Int. Cl.³ F16H *37/00*; F16D *67/04*

U.S. Cl. 74—15.66 **6 Claims**



1. A power take-off, comprising:

a housing;

a power transmission speed-changing gear train rotatably journaled at least partially in said housing, said train including an output shaft;

drive means including a drive shaft rotatably connected to

an engine for supplying rotary power to said train to rotate said drive shaft;

coupling means at least partially in said housing for drivingly connecting said drive means to said train, said coupling means including a first friction disk drivingly connected to said drive means and a second friction disk laterally juxtaposed to said first disk and drivingly connected to said train, said coupling means further including a pressure plate juxtaposed to said disks and first spring means engaging said plate for forcing same away from said disks to uncouple said train from said drive means;

braking means in said housing for arresting rotary motion of said output shaft upon uncoupling of said drive means and said train, said braking means including a piston shiftable parallel to the movement of said plate upon hydraulic actuation of said piston to arrest said rotary motion of said output shaft, and a second spring means biasing said piston to permit said rotary motion of said output shaft; and

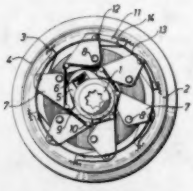
hydraulic circuit means including a first pressure space adjacent to said plate opposite said disks, a second pressure space adjacent said piston and a pressure source energized by said engine and effective only during operation of said engine for pressurizing said first space to urge in opposition to said first spring means said plate against said disks to force same to clutchingly engage one another, whereby said drive means is drivingly connected to said train, and to relieve said second space whereby said second spring means releases the braking means, said second space being relieved upon inactivation of said engine.

4,399,716

TORQUE TRANSMITTING DEVICE

Birger K. L. Karlsson, Lyckebo, Box 1062, S-360 14 Väckelsang, Sweden

Filed Jan. 26, 1981, Ser. No. 228,510
Claims priority, application Sweden, Feb. 12, 1980, 8001076
Int. Cl.³ F16D *27/10*
U.S. Cl. 74—125.5 **5 Claims**



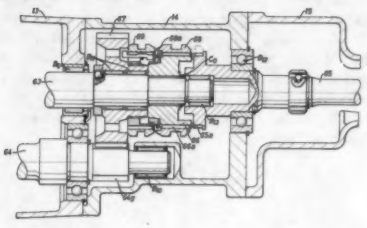
1. A device for transmitting torque between a shaft and an outer annular element, comprising; at least one eccentric device arranged for rotation with the shaft, said eccentric device including a cam element which is displaceable at right angles to the input shaft and which is biased towards its outermost position by means of a spring; and a plurality of rocker arms in a uniform spaced relationship around the shaft which can be activated by the eccentric device, each of the rocker arms provided with engaging means arranged to be brought into driving engagement with the annular element by movement of said rocker arm, and in which device the effective length of the eccentric device is arranged to vary in dependence upon the force required to activate a rocker arm, thereby to obtain between the shaft and the annular element a transmission ratio which varies in dependence upon the load on the annular element.

4,399,717

CHANGE-SPEED TRANSMISSION FOR WHEELED VEHICLES

Masayoshi Funato, and Katunori Watanabe, both of Toyota, Japan, assignors to Toyota Jidosha Kogyo Kabushiki Kaisha, Toyota, Japan

Filed Feb. 23, 1981, Ser. No. 237,418
Claims priority, application Japan, Oct. 15, 1980, 55-144928
Int. Cl.³ F16H *3/38*
U.S. Cl. 74—339 **5 Claims**



1. A power transmission unit having a change-speed gearing including a front output shaft and a countershaft arranged in parallel with an input shaft, and a plurality of change-speed gears on said front output shaft and in meshing engagement with respective counter gears on said countershaft to provide a selected speed-ratio drive power train, said countershaft being drivingly connected to said input shaft to receive an input torque thereon, comprising:

a rear output shaft coaxially arranged with said front output shaft, said rear output shaft having a front end portion provided at its outer periphery with a spline and rotatably coupled with the rear end of said front output shaft;

a clutch hub fixedly mounted on said front output shaft and located at one side thereof adjacent to the front end portion of said rear output shaft, said clutch hub being provided at its outer periphery with a spline corresponding with the outer spline of said rear output shaft;

a first hub sleeve axially slidably coupled over said clutch hub and being provided at its inner periphery with a spline in engagement with the outer spline of said clutch hub, said first hub sleeve capable of being brought into engagement with the outer spline of said rear output shaft during the shifting operation thereof toward said rear output shaft, to thereby provide a torque transmission between said front and rear output shafts;

a speed-reduction driven gear rotatably mounted on said front output shaft and located adjacent to the other side of said clutch hub, said driven gear being provided with a hub portion confronting with said clutch hub and being in meshing engagement with an additional counter gear on said countershaft to thereby provide a high power torque transmission from said countershaft to both said front and rear output shafts at a lower speed than that of the selected speed-ratio drive power train; and

a second hub sleeve axially slidably coupled over the hub portion of said driven gear by means of a spline connection, said second hub sleeve being provided at its inner periphery with a spline corresponding with the inner spline of said first hub sleeve and capable of being brought into engagement with the outer spline of said clutch hub during the shifting operation thereof toward said clutch hub to effect the high power torque transmission when said first hub sleeve is engaged with the outer spline of said rear output shaft.

4,399,718
PIVOT DRIVE FOR MANIPULATOR

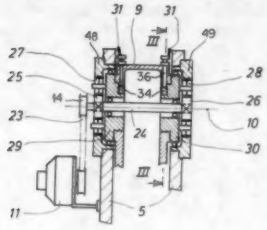
Ernst Zimmer, Friedberg, Fed. Rep. of Germany, assignor to Kuka Schweissanlagen & Roboter GmbH, Augsburg, Fed. Rep. of Germany

Filed May 28, 1981, Ser. No. 267,756

Claims priority, application Fed. Rep. of Germany, May 29, 1980, 3020378; Apr. 14, 1981, 3115061

Int. Cl.³ F16H *1/32, 55/18*

U.S. Cl. 74—409 **14 Claims**



1. A pivot drive for interconnecting a pair of members that are relatively pivotal about a pivot axis, said drive comprising:

a torsion rod extending along a rod axis and having outer ends;

drive means for rotating said rod about said rod axis relative to one of said members;

respective constant-mesh gear trains including respective input gears fixed on said outer ends and respective output gears connected to the other of said members and having respective centers, at least one of said output gears being limitedly angularly displaceable about the respective center relative to said other member; and

means for rotating said one output gear relative to said other member about the respective center and thereby torsionally prestressing said rod and for locking said one output gear in position with said torsion rod prestressed.

4,399,719
TWIN SCREW EXTRUDER WITH POWER BRANCHING GEARING

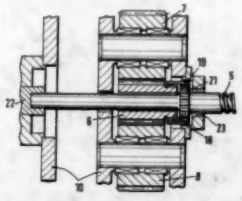
Siegfried Chszaniecki, and Wilhelm Brand, both of Hanover, Fed. Rep. of Germany, assignors to Hermann Berstorff Maschinenbau GmbH, Hanover, Fed. Rep. of Germany

Filed Mar. 9, 1981, Ser. No. 241,518

Claims priority, application Fed. Rep. of Germany, Mar. 12, 1980, 3009398

Int. Cl.³ F16H *57/00, 1/20*

U.S. Cl. 74—410 **2 Claims**



1. An extruder with twin screws and associated output drive shafts, and power branching gearing for driving said output drive shafts, comprising:

(a) a gear casing;

(b) a driven pinion drivably connected to one of said output drive shafts;

(c) a first pair of intermedate gears of the same size and disposed opposite one another in engagement with said driven pinion, and means for mounting said first pair of intermediate gears in said gear casing such that said intermediate gears are capable only of rotational movement in said casing;

(d) a drive pinion drivably connected to an operating shaft for imparting torque to said gearing;

(e) a second pair of intermediate gears of the same size and disposed opposite one another in engagement with said drive pinion, and means for mounting said second pair of intermediate gears in said gear casing such that said gears are capable only of rotational movement in said casing;

(f) a first gear of said first pair of intermediate gears engaging a first gear of said second pair of intermediate gears on one side of a line through the axes of said drive and driven pinions;

(g) a second gear of said first pair of intermediate gears engaging a second gear of said second pair of intermediate gears on the opposite side of said line, and

(h) means for mounting said drive pinion and said driven pinion for radial movement, relative to the axes of said pinions, in said gear casing,

thereby providing uniform power transmission to said pinions and said output drive shafts.

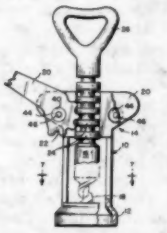
4,399,720
CORK PULLER

Darrell J. Cuppett, New York, N.Y., assignor to Towle Manufacturing Company, Boston, Mass.

Filed May 17, 1982, Ser. No. 379,252

Int. Cl.³ B67B *7/32*

U.S. Cl. 81—3.37 **7 Claims**

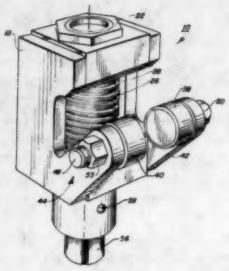


1. A cork puller comprising a structure having a bottom part of annular configuration adapted to rest on the top rim of the corked bottle and a top part comprising a sleeve, spaced, parallel bearing supports at equal radial distances from the axis of the sleeve and extending laterally from opposite sides of the axis of the sleeve, said bearing supports being integral with the sleeve, a puller reciprocally and rotatably mounted in the sleeve, a worm fixed to the lower end of the puller, means at the upper end of the puller for effecting its rotation, and means for raising and lowering the puller relative to the bottom part comprising racks at opposite sides of the puller and levers, provided with teeth, pivotally mounted on the bearing supports with their teeth engaged with the racks, the improvement comprising that one half of the sleeve taken on a diameter midway between the bearing supports and the bearing support integral therewith is integral with the bottom part and the other half and bearing support integral therewith is not and there are interengaged means on the confronting sides of the bearing supports confined exclusively to the confronting sides which define bearings for rotatably receiving the levers.

4,399,721
WRENCH

Byrl A. Jedlicka, 15 Greenridge Dr., Decatur, Ill. 62526

Filed Aug. 27, 1981, Ser. No. 296,836
Int. Cl.³ B25B 13/00
U.S. Cl. 81—57.46 5 Claims



1. A wrench for tightening and loosening installed turnbuckles in which the turnbuckle is of the type comprising an externally smoothly contoured sleeve that at one end of same threadedly receives a first threaded member having a right hand thread and that at the other end of same threadedly receives a second threaded member having a left hand thread, with the sleeve being of a predetermined size,

said wrench comprising:

a body,

a worm screw journalled in said body for rotational movement about the axis of same and having external worm threading thereon,

said body being formed to define an opening in which a circumferential portion of said worm screw threading at one side of said body is exposed,

and roller means journalled on said housing adjacent said opening and rotatable about an axis disposed at said side of said body and spaced from and extending across said body opening and extending substantially at right angles to the plane that includes said worm screw axis,

said roller means roller surfacing forming a rolling abutment for the turnbuckle sleeve to be seated against in applying the wrench exposed screw worm threading against the turnbuckle sleeve, with said roller means surfacing being separated from said exposed screw worm threading a distance that is less than the turnbuckle sleeve size,

whereby said wrench screw worm threading on said wrench being positioned to seat the turnbuckle sleeve simultaneously against same and said roller means, inpinges against the sleeve for effecting coupled relation of said threading to the sleeve on rotation of said screw worm, for adjusting the turnbuckle sleeve relative to the turnbuckle threaded members.

4,399,722
SOCKET WRENCH INCLUDING QUICK-RELEASE ADAPTOR

Vincent Sardo, Jr., 220 W. Skyline Lakes Dr., Ringwood, N.J. 07456

Filed Mar. 6, 1981, Ser. No. 241,224
Int. Cl.³ B25B 13/46
U.S. Cl. 81—60 5 Claims

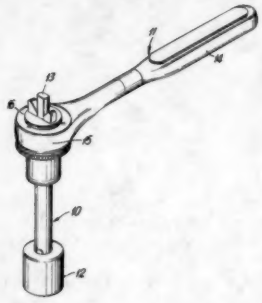
1. A socket wrench comprising:

a wrench portion including an elongated handle and a head portion at one end with an aperture therethrough,

an insert mounted within the head aperture and driving means coupling the insert to the head portion, said insert being rotatably driven by the action of the wrench portion upon actuation thereof through the driving means and said insert having an aperture extending axially therethrough, and including an elongated pushbutton slidably mounted within the axial aperture and normally protruding therefrom at one end and a stud portion at the other end from which the pushbutton moves outwardly when depressed at its other end,

a socket having a body portion, upper and lower axial apertures, a first inner portion in the upper aperture comprising interior walls having at least one locking recess therein and a second outer portion in the lower aperture of enlarged diameter comprising interior walls having gripping means spaced thereabout, and,

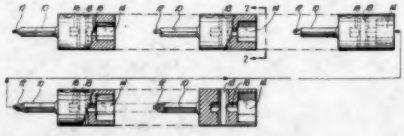
a one piece hollow adaptor having means at one end to removably engage the insert stud, said means being coupled to the pushbutton for actuation thereby and coupling means at one end to engage a locking recess in the upper socket aperture, a slidable shaft mounted axially within the adaptor and in engagement therewith and engageable by the pushbutton at one end to be moved downwardly within the adaptor to actuate the coupling means cooperating with the socket and whereby depressing the pushbutton a first distance selectively actuates the coupling means to disengage the shaft from the locking recess in the socket wall releasing the socket from the adaptor and further depression of the pushbutton disengages the adaptor engaging means from the stud freeing the adaptor from the insert.



4,399,723
COMPACT COMBINATION TOOL SET

Gilles Marleau, 85 Brady St., Hull, Quebec, Canada J8Y 5L6

Continuation-in-part of Ser. No. 56,725, Jul. 11, 1979, abandoned. This application Sep. 25, 1980, Ser. No. 190,714
Int. Cl.³ B25G 1/08
U.S. Cl. 81—437 4 Claims



1. A compact combination tool set comprising:

a plurality of inter-fitting tool segments;

each tool segment having a tool projecting from one end thereof and a recess at the other end thereof adapted to receive a tool projecting from one end of a second tool segment;

said recesses and said projecting tools including portions which are non-circular in cross-section and which are

adapted to be telescopically and frictionally inter-engaged so as to prevent relative rotation thereof;

each of said projecting tools being of the same length and cross-section and each of said recesses being of a length sufficient to fully receive said tools therein;

whereby a plurality of tool segments may be selectively inter-fitted for compact storage, and selectively separated for use in any one of said recesses.

4,399,724

LATHE MACHINE FOR TURNING WHEEL SETS, ESPECIALLY SETS OF RAILROAD WHEELS

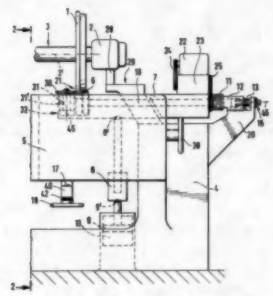
Theodor Dombrowski, Erkelenz, Fed. Rep. of Germany, assignor to Wilhelm Hegenscheidt Gesellschaft mgH, Erkelenz, Fed. Rep. of Germany

Filed Feb. 5, 1981, Ser. No. 231,598

Claims priority, application Fed. Rep. of Germany, Apr. 3, 1980, 3012997

Int. Cl.³ B23B *5/32*

U.S. Cl. 82—8 **9 Claims**



1. A lathe machine for turning wheel sets having a common axis, comprising two groups of rollers, at least one roller group being provided for each wheel of a set, each roller group comprising first support roller means (**6**, **6'**) for contacting the circumference of one wheel of said wheel set, second roller means (**30**, **30'**) for contacting a wheel surface facing axially inwardly of said one wheel, said first and second roller means of a group being arranged in pairs, each pair comprising a wheel circumference contacting support roller and an axially inwardly facing wheel surface contacting roller, each roller group further comprising common support means (**7**, **32**) for said first and second roller means, said common support means carrying the first and second roller means of a group with a rigid fixed relationship between the first and second roller means of a group so that all axial force components are taken up by said common support means and the wheel set is secured against axial displacement by short circuiting of these axial force components in each pair of rollers independently of the other pair.

4,399,725

METHOD AND APPARATUS FOR CUTTING PLASTIC MATERIALS

Ernest A. Milan, Stow, Ohio, assignor to The Goodyear Tire & Rubber Company, Akron, Ohio

Filed May 15, 1981, Ser. No. 264,007

Int. Cl.³ B26D *7/02, 7/08*

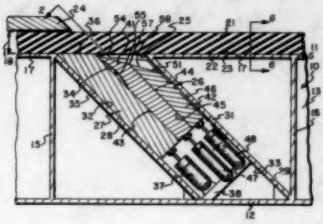
U.S. Cl. 83—17 **20 Claims**

13. A method of cutting a strip of plastic material having top and bottom sides comprising the steps of

(a) clamping said strip in a supporting structure at a position next to the position where the strip is to be cut,

(b) moving a cutting blade from a retracted position a predetermined initial amount to a first position in cutting engagement with said strip at said bottom side,

(c) moving a supporting blade from said retracted position alongside said cutting blade to said first position in lifting engagement with said bottom side of said strip,



(d) moving said cutting blade from said first position completely through said strip while said supporting blade is in lifting engagement with said strip in said first position,

(e) retracting said cutting blade and said supporting blade to said retracted position, and

(f) unclamping said strip for movement of said strip away from said cutting blade.

4,399,726

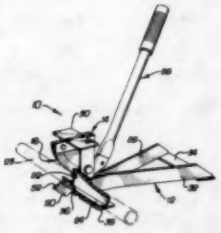
CUTTING DEVICE

Victor Zacuto, 5705 Bevis Ave., Van Nuys, Calif. 91411

Filed Mar. 26, 1981, Ser. No. 247,842

Int. Cl.³ B26D *3/16*

U.S. Cl. 83—411 R **31 Claims**



1. A device for severing plastic tubing or the like comprising a rigid frame,

an inverted L-shaped frame securely mounted upon said rigid frame and extending in a forwardly direction thereon,

said L-shaped frame including a horizontally disposed stabilizer and a pair of spaced vertically disposed members proximate the upper ends of and between which said stabilizer is secured, whereby said stabilizer extends forwardly relatively to said rigid frame,

cutting means including a singular blade and being securely mounted to and proximate a forward end of said stabilizer and to and proximate a lower end of said pair of spaced vertically disposed members whereby said blade is exposed in a generally forward direction relative to said rigid frame,

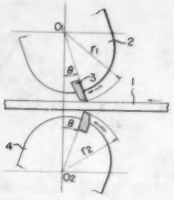
balancing members included in and extending laterally of said rigid frame and being disposed generally below said pair of spaced vertically disposed members, and

a mandible including a channel therein and being pivotally mounted upon said pair of vertically disposed members whereby the channel cooperatively acts with said singular blade in operation of the device.

4,399,727
DRUM SHEAR

Shunji Omori; Kanji Hayashi; Yukio Hiasa; Nobutaka Maeda; Shoichi Hashimoto, and Hiroki Yoshiya, all of Hiroshima, Japan, assignors to Mitsubishi Jukogyo Kabushiki Kaisha, Tokyo, Japan

Filed Jan. 26, 1981, Ser. No. 228,699
Claims priority, application Japan, Feb. 20, 1980, 55-19886
Int. Cl.³ B23D *25/12*
U.S. Cl. 83—345 3 Claims



1. In a drum shear for shearing a workpiece, said drum shear being of the type including a pair of rotatable drums, each said drum including a longitudinal shearing blade, and said drums being arranged such that upon rotation of said drums a workpiece passing therebetween is bitten between and sheared by said blades, the improvement wherein:

said drums rotate at equal angular velocities;

a first radial distance between the outer edge of a first said blade and the rotational axis of the respective first said drum is greater than a second radial distance between the outer edge of a second said blade and the rotational axis of the respective second said drum, the ratio of said first radial distance to said second radial distance being 1.02 to 1.20, such that the circumferential velocity of said outer edge of said first blade is greater than the circumferential velocity of said outer edge of said second blade; and

said first and second drums being rotated by drive means such that at the beginning of an operation of shearing a workpiece said outer edge of said first blade first contacts the workpiece at a first longitudinal position along the direction of movement of the workpiece, said outer edge of said second blade first contacts the workpiece at a second longitudinal position along said direction of movement, and said first longitudinal position is upstream of said second longitudinal position with respect to said direction of movement, thereby defining a gap extending upstream from said outer edge of said second blade, such that during the shearing operation said outer edge of said first blade moves in a direction relative to said outer edge of said second blade to sequentially reduce the size of and eliminate said gap, and such that upon completion of the shearing operation said outer edge of said first blade is downstream of said outer edge of said second blade with respect to said direction of movement.

4,399,728
SAW WORKPIECE PUSHING DEVICE

Leo L. Davis, 1207 Woodland Cir., Bolivar, Mo. 65613

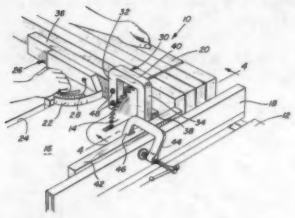
Filed Mar. 23, 1981, Ser. No. 246,851
Int. Cl.³ B27B *5/22*
U.S. Cl. 83—418 4 Claims

1. A saw workpiece pushing apparatus for use in combination with a table saw, said apparatus comprising:

pushing means for guiding and pushing said workpiece into cutting contact with a cutting blade operably associated with said table saw;

guide means for facilitating a guiding of said workpiece past said cutting blade during said cutting contact;

extension means operably connected with said pushing means and serving to remove cut portions of said workpiece from a vicinity of said cutting blade thereby to eliminate a need for an operator to perform such a removing operation manually thus to substantially reduce a danger of injury to said operator, said pushing means including an inverted U-shaped member portion which is designed to slidably move along said guide means and which can move over and past said cutting blade without any interference and contact between said blade and pushing means, said extension means being fixedly secured to said inverted U-shaped member portion, said U-shaped member portion including first and second downwardly extending legs, said first downwardly extending leg being

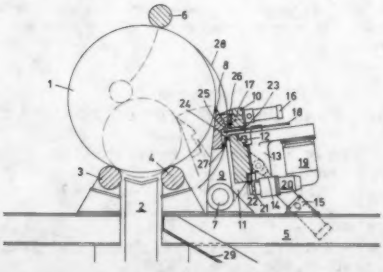


attached to an elongated extension member and said second downwardly extending leg being attached to said extension means, said guide means comprising an elongated member selectively attachable to a table saw guide fence in an abutting relationship therewith, said pushing means being selectively attachable to a miter gauge conventionally associated with a table saw, said guide means being provided with a slot on a topmost portion thereof, said slot facilitating an attachment of said guide means to said fence through an operable positioning of a C-clamp therein, said C-clamp being operable to hold said guide means and said fence together in said abutting relationship.

4,399,729
APPARATUS FOR SEVERING THE END OF A METAL STRIP WOUND IN A COIL

Hans Malinowski; Klaus-Peter Pielsticker, both of Dusseldorf, Fed. Rep. of Germany, and Ernst Linsinger, Steyrermuhl, Austria, assignors to SMS Schloemann-Siemag Aktiengesellschaft, Dusseldorf, Fed. Rep. of Germany

Filed Jan. 30, 1981, Ser. No. 229,784
Claims priority, application Fed. Rep. of Germany, Feb. 9, 1980, 3004952
Int. Cl.³ B26D *7/02, 1/20*
U.S. Cl. 83—455 9 Claims



1. Apparatus for severing the end of metal strip wound in a coil comprising a base member, means on said base member for

rotatably supporting said coil of metal strip, a wedge mounted in an operative position with respect to said coil for lifting the coil end away from but closely adjacent the coil as the coil is rotated in a direction of unwinding, a strip guide surface on said wedge for supporting the lifted coil end closely adjacent the coil, a rotary cutting tool, a cutting tool feed guide mounted in an operative position with respect to said coil and cooperatively engaging said rotary cutting tool so that said cutting tool is movable in a direction substantially transverse to the unwound strip supported on the strip guide surface to thereby sever the unwound strip from the coil, a drive means for moving said rotary cutting tool along said feed guide and a drive means for rotating said cutting tool.

4,399,730

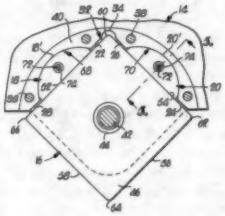
FLOATING ANGLE KNIFE FOR METAL WORKING MACHINES

Harry L. Oswalt, Jr., 615 Briar Hill, Garden City, Kans. 67846

Filed May 7, 1981, Ser. No. 261,045

Int. Cl.³ B23D *15/04, 23/00*

U.S. Cl. 83—579 **8 Claims**



1. In a shearing machine,

a stationary cutter blade having a notch for receiving angle stock to be sheared;

a shiftable support having a recess;

a quadrilateral cutter plate having a pair of opposed, flat faces and two pairs of peripheral edges, presenting four corners,

said plate extending into the recess, disposing a first pair of said edges within the recess,

a second pair of said edges merging toward one of said corners,

said one corner being disposed exteriorly of the recess,

said plate being carried by the support for movement of said one corner into and out of engagement with the stock in said notch during shifting of the support;

a pair of abutments in said recess each engaging a respective one of said first pair of edges for resisting the load to which the plate is subjected when said one corner is moved against the stock,

said plate and said abutments being rotatable relative to the support in response to movement of said one corner against the stock; and

rigid stop means disposed in said recess for engagement by said first pair of edges for limiting the extent of rotation of the plate relative to the support.

4,399,731

APPARATUS FOR AUTOMATICALLY COMPOSING MUSIC PIECE

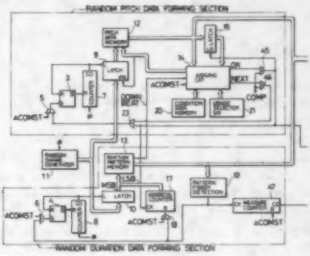
Eiichiro Aoki, Hamamatsu, Japan, assignor to Nippon Gakki Seizo Kabushiki Kaisha, Hamamatsu, Japan

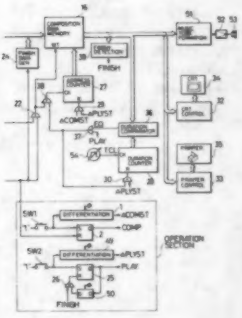
Filed Aug. 4, 1982, Ser. No. 405,144

Claims priority, application Japan, Aug. 11, 1981, 56-125603; Aug. 24, 1981, 56-132493; Aug. 24, 1981, 56-132494; Oct. 5, 1981, 56-158437

Int. Cl.³ G10H *1/00*

U.S. Cl. 84—1.03 **17 Claims**





1. An apparatus for automatically composing a music piece, comprising:

pitch data memory means storing plural kinds of pitch data representing respective musical note pitches;

extracting means connected to said pitch data memory means for extracting, one after another, pitch data by randomly accessing the stored pitch data;

condition providing means for providing predetermined plural kinds of musical conditions;

judging means supplied with said extracted pitch data and connected to said condition providing means for judging whether each said extracted pitch data satisfies said musical conditions;

deliver-out means connected to said judging means for delivering out, from among said extracted pitch data, only those that satisfy said musical conditions successively in timed sequence; and

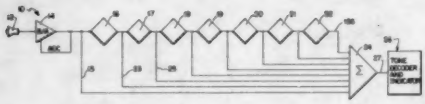
duration imparting means connected to said deliver-out means for combining each said delivered pitch data with a duration data representing a musical time length to form successively, in timed sequence, composition data as combined pairs of a pitch data and a duration data, thus a timewise alignment of said composition data constituting a music piece.

4,399,732

PITCH IDENTIFICATION DEVICE

Stanley Rothschild, 906 Kerwin Rd., and Samuel E. Ramsay, 202 Indian Spring Dr., both of Silver Spring, Md. 20901

Filed Aug. 28, 1981, Ser. No. 297,270
Int. Cl.[3] G10G 7/00; G01H 13/00
U.S. Cl. 84—454 12 Claims



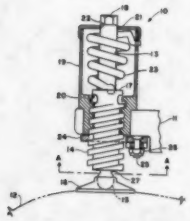
1. A device for determining the pitch of a sound, comprising:
a transducer for converting said sound into an electrical signal;
frequency translation means for translating the frequency of said electrical signal to a predetermined octave range;
a plurality of frequency sensitive means connected to said frequency translation means, each of said frequency sensitive means being tuned to detect directly the frequency of one pitch in said predetermined octave band; and
display means connected to each of said frequency sensitive means for indicating the pitch of a signal detected thereby.

4,399,733

SEMIAUTOMATIC SWAYBRACE

John C. Mick, Webster Groves, Mo., assignor to The United States of America as represented by the Secretary of the Air Force, Washington, D.C.

Filed Aug. 28, 1981, Ser. No. 297,459
Int. Cl.[3] F41F 5/02
U.S. Cl. 89—1.5 B 3 Claims



1. A sway brace for steadying a load suspended from an aircraft, comprising:
a. a threaded rod;
b. a sleeve, supported by said aircraft, having threads on an inwardly disposed surface thereof, for receiving and supporting said threaded rod for rotation about its axis; and
c. torsional spring means, supported by said sleeve, and engaging said rod, for simultaneously rotating and axially extending said rod along said threads into contact with said load.

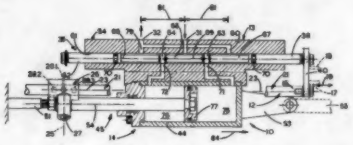
4,399,734

POWER ASSIST DEVICE FOR CONTROL SYSTEM

Jacob Kobelt, 6110 Oak St., Vancouver, British Columbia, Canada V6M 2W2

Filed Jul. 29, 1980, Ser. No. 173,350
Int. Cl.[3] F01B 31/12
U.S. Cl. 91—1 8 Claims

1. A power assist device adapted to amplify force of a control signal to actuate an apparatus, the power assist device including a directional valve means having a valve body with a valve bore, and a valve spool movable within the bore along a valve axis in response to the control signal, the valve body having a fluid inlet means to receive pressurized fluid and a fluid outlet means to discharge fluid, the valve body also having first and second fluid conduits which can communicate through the valve bore with either the fluid inlet means or fluid outlet means as determined by relative position of the valve spool so as to transmit fluid relative to the valve body, the device also including a fluid power cylinder assembly having a cylinder body, a piston and a piston rod, the piston rod and piston being fixed so that the cylinder body is reciprocable relative to the piston, the cylinder body being connected to the valve body for mutual movement, and also cooperating with the apparatus to apply an amplified control signal thereto, the piston defining in part first and second chambers on opposite sides thereof, the first and second chambers communicating with the first and second fluid conduits of the directional valve means, the power assist device being further characterized by:



(a) a guide rod having a longitudinal guide axis disposed parallel to the valve axis, the rod being connected essentially rigidly to the valve spool for equal concurrent movement therewith along the guide axis in response to the control signal, the rod also having guide indexing means representing particular control settings,
(b) a fixed guide holder cooperating with the guide rod to permit the guide rod to move axially relative to the guide holder, the guide holder having a holder indexing means complementary to the guide indexing means to serve as a datum and to register with the guide indexing means at a particular control setting,
so that when the valve spool is shifted to direct fluid into one chamber and discharge fluid from the opposite chamber, the indexing means are disengaged and engaged as required to indicate attainment of a particular control setting, and the cylinder body shifts to actuate the apparatus in response to the control signal.

4,399,735

BRAKE BOOSTER

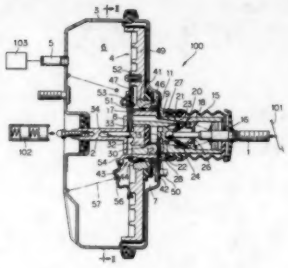
Masayoshi Katagiri, Toyota; Osamu Ogura, Nagoya, and Takashi Fujii, Toyota, all of Japan, assignors to Toyota Jidosha Kogyo Kabushiki Kaisha and Aisin Seiki Kabushiki Kaisha, both of Aichi, Japan

Filed Oct. 6, 1980, Ser. No. 194,404
Claims priority, application Japan, Nov. 21, 1979, 54-151238
Int. Cl.[3] F15B 9/10
U.S. Cl. 91—369 B 12 Claims

1. In a brake booster in which an output stroke of an output member is greater than an input stroke of an input member and which comprises (a) a casing, (b) a power piston axially movably disposed in said casing between said input and output members to divide an interior space of said casing into two pressure chambers, said power piston being actuated by a pressure difference between said two pressure chambers and having an internal surface defining an axially formed central bore, (c) a control piston having an external peripheral surface, and containing therein a control valve mechanism for controlling said pressure difference and further having a first transmission mechanism for transmitting an input force from said input member toward said output member, said control piston being coaxially received in said central bore and axially movable relative to said power piston, and (d) a reaction lever having an intermediate output portion, and first and second input portions located on opposite sides of said output portion, said first

and second input portions receiving output forces of said first transmission mechanism and said power piston, respectively, said output portion abutting on said output member, an improvement comprising:

a second transmission mechanism including at least one ball associated with the external peripheral surface of said control piston and the internal peripheral surface of said power piston defining said central bore, and a ball retainer axially movably disposed and loosely retaining said at least one ball, said ball retainer abutting, on said second input portion of said reaction lever, said external peripheral surface having a recess whose depth increases progressively in the direction of advanvement of said power piston toward said output member, said internal peripheral surface including a ball driving surface and further including a ball locking surface, said at least one ball engaging



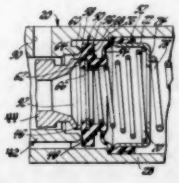
said driving and locking surfaces such that said driving surface drives said at least one ball together with said power piston while said power piston is advanced relative to said control piston and such that said locking surface prevents said at least one ball from radially outwardly moving off the bottom surface of said recess after said power piston is advanced through a predetermined distance, whereby, in an initial operating stage of said booster, the output force of said power piston is transmitted to said reaction lever via said at least one ball and said ball retainer, and after the predetermined distance of advancement of said power piston and the resultant locking of said at least one ball between said locking surface and the bottom surface defining the part of said recess, a reactionary force from said output member is transmitted to said control piston but not to said power piston.

4,399,736

VACUUM SUSPENDED BRAKE BOOSTER CONTROL VALVE

Malvin L. Schubert, Kettering, Ohio, assignor to General Motors Corporation, Detroit, Mich.

Filed Feb. 23, 1981, Ser. No. 237,528
Int. Cl.³ F15B *9/10, 13/04*
U.S. Cl. 91—469 **4 Claims**



1. A floating control valve body for a vacuum suspended brake booster, said valve body being adapted for axial and limited pivotal movements to accommodate minor misalignments, said valve body comprising:

a rubber-like molded annular valve ring having radially spaced and substantially concentric inner and outer portions with coplanar annular valve face surfaces relatively movable with respect to an annular air valve seat and an annular vacuum valve seat for respectively selective sealing engagement with said annular air valve seat and said annular vacuum valve seat,

an annular reinforcing ring molded in said valve ring inner portion with the outer periphery of said reinforcing ring terminating radially inward of said valve ring outer portion and sufficiently hard and stiff to provide axially and circumferentially stiff reinforcement for said valve ring inner portion but not for said valve ring outer portion,

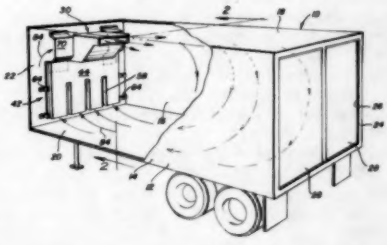
and an axially opening annular recess formed in said valve ring radially between said valve ring inner and outer portions and providing flexibility of said outer portion relative to said inner portion to accommodate minor misalignment between said valve seats, thereby to assure full annular sealing engagement of said outer portion with the vacuum valve seat when such sealing engagement is selected.

4,399,737

CORRUGATED AIR RETURN BULKHEAD

Sylvester B. Severson, Rice Lake, Wis., assignor to J. Charles Peterson and Roger Nelson, both of Rice Lake, Wis.

Filed Jun. 10, 1981, Ser. No. 272,123
Int. Cl.³ B60H *1/26*
U.S. Cl. 98—6 **3 Claims**



1. In combination with a container for storage and shipment of temperature controlled materials and wherein said container includes an airflow heat exchanger assembly mounted on a upper portion of one wall of said container and said heat exchanger assembly includes a central downwardly opening air inlet, a pair of upper opposite side horizontally and oppositely outwardly opening side air inlets and a central upper temperature conditioned air outlet, an air return bulkhead including upstanding opposite side marginal edges and top and bottom marginal edges and mounted on said one wall defining, in conjunction with said one wall, an upstanding return airflow path between said one wall and said bulkhead bounded by said side marginal edges and including a central portion and opposite side wall portions, the central portion of the upper end of said return airflow path being registered with said central downwardly opening air inlet, upper opposite side extensions for said bulkhead vertically adjustable relative thereto and defining open ended horizontal flow paths above said top marginal edge and into which the opposite side portions of said upper end of said air return flow path open, the remote ends of said horizontal flow paths opening outwardly along said one wall and the adjacent ends of said horizontal flows paths being registered with said side air inlets, a plurality of vertically spaced horizontal mounting bars secured to said front wall, said bulkhead including vertically extending laterally spaced corrugations formed in at least the lower portion thereof with portions of said corrugations abutted against said one wall, said

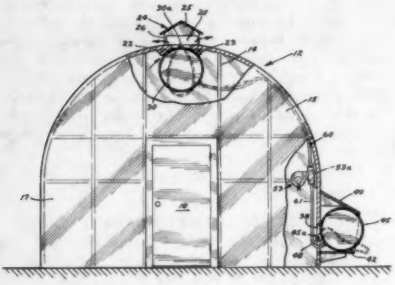
portions of said corrugations including a plurality of vertically spaced sets of horizontally spaced and aligned notches formed therein in which longitudinally spaced portions of said bars are received, the notched portions of said corrugations being removably secured to said bars.

4,399,738

VENTILATING STRUCTURE FOR GREENHOUSE

Arlis F. Sharkey, 705 Henriette St., Crivitz, Wis. 54114

Filed Dec. 29, 1980, Ser. No. 220,837
Int. Cl.³ F24F *13/10*
U.S. Cl. 98—32 **3 Claims**



1. Inflatable air vent regulating means for a greenhouse, having in combination

a greenhouse structure convex in cross section having a ridge portion and side wall portions,

an air vent open to the atmosphere formed in said ridge portion,

an inflatable substantially tubular member having closed ends and being coextensive with said vent,

means mounting said tubular member adjacent said vent,

a pressurized air supply,

an air line running from said air supply to said tubular member to inflate the same,

a plate member depends inwardly of said greenhouse from each side of said vent and adjacent each side of said tubular member,

whereby said tubular member in inflated condition engages and seals against said plate members.

4,399,739

NOISE ATTENUATING APPARATUS FOR MODULATING AIR FLOW

Raymond H. Dean, Johnson County, Kans., assignor to Tempmaster Corporation, Kansas City, Mo.

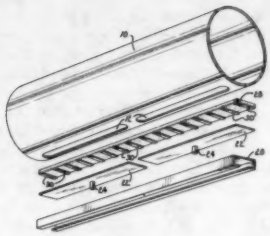
Filed Dec. 16, 1980, Ser. No. 217,049
Int. Cl.³ F24F *13/10*
U.S. Cl. 98—41 R **12 Claims**

10. Noise attenuating apparatus for modulating conditioned air flow, said apparatus comprising:

a duct adapted to receive the conditioned air, said duct presenting an elongate outlet slot having spaced apart side edges and an outside surface of the duct located adjacent said side edges;

a porous pad underlying said slot and presenting a sound absorbing medium for absorbing sound from the air encountering the pad, said pad being porous to the conditioned air and having an upper surface oriented generally parallel to said outside surface of the duct; and

an inflatable bladder located adjacent a lower surface of said pad, said bladder having a deflated condition wherein the pad is spaced below said slot in the path of air discharging therefrom and an inflated condition wherein the bladder effects squeezing of selected portions of the pad against side edges of said slot to seal the slot against air flow with



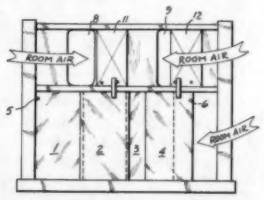
the squeezing of said selected portions of the pad decreasing the porosity of said selected portions.

4,399,740

FUME HOOD WITH DUAL ROOM AIR INLET SYSTEMS

Jon A. Zboralski, Manitowoc, Wis., assignor to Hamilton Industries, Inc., Two Rivers, Wis.

Filed Dec. 14, 1979, Ser. No. 103,663
Int. Cl.³ F23J *11/00*
U.S. Cl. 98—115 LH **5 Claims**



1. A fume hood comprising: a housing with a horizontally slidable sash and a room air vent located directly above the sash; a horizontally slidable damper for altering room air flow through the vent; a pair of laterally spaced abutment members on one of the sash and damper; and a bar member on the other of the sash and damper located between the abutment members, so that the sash can horizontally travel a greater distance than the damper but still move the damper in response to movement of the sash, such abutment members and bar member being engageable so as to transmit at least a portion of movements to the left and a portion of movements to the right of the sash into lateral movements of the damper.

4,399,741

METHOD OF CONTROLLING ROOM AIR FLOW INTO A FUME HOOD

Jon A. Zboralski, Manitowoc, Wis., assignor to Hamilton Industries, Inc., Two Rivers, Wis.

Filed Dec. 14, 1979, Ser. No. 103,664
Int. Cl.³ F23J *11/00*
U.S. Cl. 98—115 LH **3 Claims**

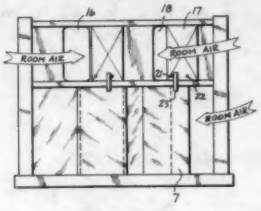
1. A method of controlling room air flow into a fume hood having a horizontally slidable sash and a room air vent comprising the steps of:

(a) horizontally sliding the sash to change a sash passage into the hood; and

(b) transmitting at least a portion of the sash's sliding movements to the left and at least a portion of the sash's sliding movements to the right into lateral movements of a damper moving the damper across the vent to change a vent passage in an inverse manner to the change in a sash passage;

wherein the method includes progressively opening and clos-

ing the sash while progressively closing and opening the damper, and further includes moving the sash a given horizontal distance before moving the damper, whereby the total travel of the sash is greater than the damper travel.



4,399,742

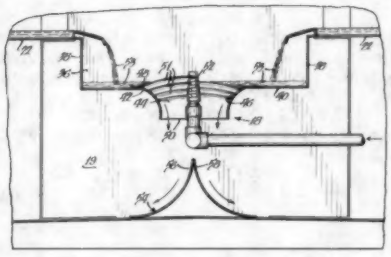
AIR WASHER PARTICULARLY FOR PAINT SPRAY BOOTHS

Frank L. Dobias, Livonia, Mich., assignor to Binks Manufacturing Company, Franklin Park, Ill.

Continuation of Ser. No. 155,586, Jun. 2, 1980, abandoned, which is a division of Ser. No. 877,005, Feb. 13, 1978, Pat. No. 4,239,512, which is a continuation-in-part of Ser. No. 817,577, Jul. 21, 1977, abandoned. This application Jan. 4, 1982, Ser. No. 336,902

Int. Cl.³ B05C *15/00*; B01D *47/00*

U.S. Cl. 98—115 SB **13 Claims**



1. In an apparatus for conditioning a gas with a liquid by moving the gas through a flow passage independent of interaction of liquid therewith and introducing the liquid into the flow passage through a nozzle, the improvement comprising: a streamlined flow passage having a relatively large inlet end and a relatively small outlet end and a smoothly curved convex interior surface progressively decreasing in cross-sectional area from its inlet end to its outlet end, and liquid sheet forming nozzle means positioned axially of said flow passage at and within the inlet end of said flow passage for forming at least one substantially continuous sheet of liquid emanating from the axis of said flow passage substantially perpendicular to said axis and covering the entrance to said flow passage, whereby liquid and gas are smoothly and rapidly accelerated between said inlet and outlet ends of said streamline flow passage.

4,399,743

VENT PIPE CAP

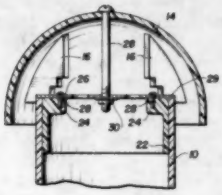
Lewis B. Izzi, Sr., Shelby, N.C., assignor to Plastic Oddities, Inc., Shelby, N.C.

Filed Oct. 15, 1981, Ser. No. 311,615

Int. Cl.³ F23L *17/02*

U.S. Cl. 98—122 **1 Claim**

1. A plumbing cap for a vent stack comprising in combination, a hemispherical plastic cover for overlapping the upper sides and end of a stack; a plurality of circumferentially spaced support lugs fixed to the inside of the cover and disposed completely inside its hemisphere; said lugs having a plurality of stair steps formed on their inner faces to fit closely on the ends of stacks of various pipe sizes and spacing the stack inside said cover and positioned to hold the cover overlapped over the upper sides and end of the stack enough to prevent lateral entry of foreign materials into the stack while maintaining the stack freely vented for exit of gases without impediment; said stack comprises a plastic pipe; and securing means comprising a plastic drain fitting dimensioned to be solvent welded inside said stack, a strainer plate fixed to said fitting and resting on said stack, and bolt means connecting said cover to said plate for securing said cover to the stack in a position with one stair step adjacent the end of the stack thereby permitting gases to freely escape from the stack about the cap while protecting the stack from entry of materials.



4,399,744

BEVERAGE CARBONATOR DEVICE

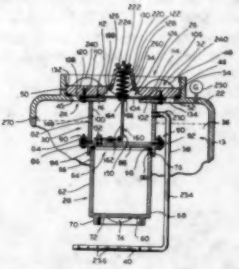
Ralph Ogden, 1304 Fisher St., Munster, Ind. 46321

Continuation-in-part of Ser. No. 251,476, Apr. 6, 1981, Pat. No. 4,347,783. This application Sep. 17, 1981, Ser. No. 303,156

The portion of the term of this patent subsequent to Sep. 7, 1999, has been disclaimed.

Int. Cl.³ B01F *3/04*

U.S. Cl. 99—323.1 **10 Claims**



1. A beverage carbonator device comprising:

an outer container open at its upper end and defining a beverage carbonation chamber and including means for selectively dispensing a carbonated beverage, when contained therein, therefrom,

and a carbonating fluid storage and pressure regulating assembly adapted to be mounted in said chamber and comprising:

a lower vessel that is adapted to receive carbonating fluid,

an upper carbonating fluid receiver having secured thereto at the lower end thereof said vessel upper end in sealed relation therewith,

said receiver defining an imperforate floor that spans said vessel upper end and that forms with said vessel a tank for containing the carbonating fluid when received therewith,

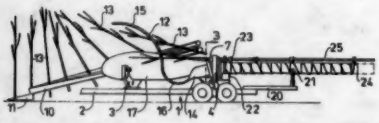
said floor defining an orifice opening to said tank,
said receiver having an open upper end that is spanned by a flexible diaphragm in sealed relation thereto,
said receiver defining between said floor and said diaphragm a pressure cavity adapted to receive carbonating fluid from said tank through said orifice opening,
a cover secured to said receiver upper end in sealed relation to said diaphragm,
said cover being formed to define with said diaphragm a vented breathing chamber, whereby said diaphragm deflects upwardly of said cavity under the pressure of carbonating fluid received in said pressure cavity,
a valve member mounted within said receiver for opening and closing said orifice,
an elongate valve member actuator link secured to said diaphragm and having a depending portion disposed within said cavity,
means for resiliently biasing said diaphragm inwardly of said cavity and toward said floor against the action of said carbonating fluid in said cavity on said diaphragm,
a carbonating fluid conduit connected to said receiver in communication with said pressure cavity at one end thereof and extending exteriorly of said assembly and having the other end of same open to said carbonation chamber for emitting carbonating fluid into said carbonating chamber,
means for securing said assembly to said container in sealed relation with said container with said tank disposed in the beverage to be carbonated,
means for charging said tank with carbon dioxide under pressure,
and means for articulating said link depending portion to said valve member for positioning said valve member relative to said orifice under the control of said diaphragm for maintaining the carbonating fluid in said container at a substantially uniform predetermined pressure.

4,399,745

METHOD OF BUNDLING BRUSHWOOD

Karl G. Jörgensen, Sollentuna; Leif L. Magnusson, Järfälla, and Curt S. Olsson, Vallentuna, all of Sweden, assignors to Sikob Svensk Industris Konstruktions-Och Beräkningskontor AB, Sollentuna, Sweden

Filed Jan. 28, 1981, Ser. No. 229,768
Claims priority, application Sweden, Feb. 6, 1980, 8000961
Int. Cl.³ B65B *13/18*
U.S. Cl. 100—2 **4 Claims**



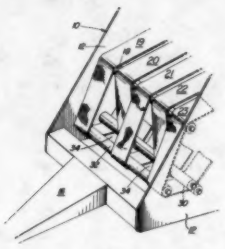
1. A method of bundling items of brushwood, as small trees, shrubs and other forms of undergrowth, severed branches and tops of larger trees, and tall grasses such as sugar cane, comprising the steps of gathering said items of brushwood into a substantially cylindrical bundle of substantially uniform diameter and a length substantially exceeding the length of the longest item of brushwood present, the various items of brushwood being oriented with their thick ends located generally on the outside of said bundle and displaced relative to one another in the longitudinal direction of the bundle and with their thinner ends extending generally inwardly of the bundle, and binding said bundle with strap-like holding elements.

4,399,746

STAGGERED ROLLS AND BELTS FOR ROUND BALER

Jean Viaud, Gray, France, assignor to Deere & Company, Moline, Ill.

Filed Jul. 20, 1981, Ser. No. 285,178
Int. Cl.³ B30B *5/06*
U.S. Cl. 100—88 **16 Claims**



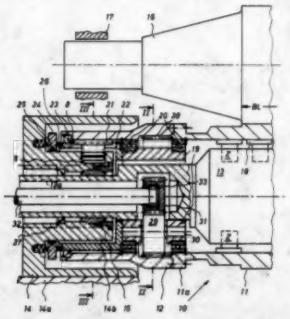
12. A round baler comprising (1) a pair of spaced sides; (2) a plurality of parallel, spaced rolls supported by and extending between said sides, said plurality of rolls comprised of a set of two adjacent rolls and a group of common rolls; and (3) a plurality of side-by-side belts between said sides and supported by said plurality of rolls, and defining a bale forming chamber having a crop inlet; the improvement comprising at least two of said plurality of belts entrained about only one roll of said set of rolls and about said group of rolls.

4,399,747

PRESS ROLL WITH ADJUSTABLE SAG CAPABILITY

Christian Schiel, Heidenheim, and Robert Wolf, Herbrechtingen, both of Fed. Rep. of Germany, assignors to J. M. Voith GmbH, Fed. Rep. of Germany

Filed Jul. 6, 1981, Ser. No. 281,229
Claims priority, application Fed. Rep. of Germany, Jul. 8, 1980, 3025799
Int. Cl.³ B30B *3/04*
U.S. Cl. 100—162 B **16 Claims**



1. A press roll with adjustable sag capability, comprising:
a hollow rotatable roll shell; a relatively nonrotatable yoke extending through the hollow roll shell; support means between the roll shell and the yoke for transmitting press force from the roll shell to the yoke in a pressing plane extending longitudinally along the roll shell;
the roll shell having ends and end regions near the ends thereof, and at each end region of the roll shell:
the yoke having a nonrotatable support including a part directly supporting the yoke;
a shell guide element being arranged generally alongside the

yoke support part and also being connected to the yoke to prevent relative rotation between the guide element and the yoke, but the yoke also being supported to be displaceable along the direction of pressing force, with respect to the guide element; the guide element being nonrotatable with respect to the support;

the roll shell being supported on the shell guide element which allows movement of the roll shell along the direction of pressing force, but the roll shell being rotatable with respect to the guide element;

the roll shell being of a longitudinal length to extend to the longitudinal region where the yoke support part is located;

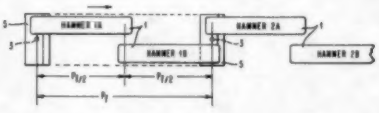
a supporting element being provided generally at the longitudinal location of the yoke support part, for supporting the roll shell against the yoke, and the supporting element being displaceable relative to the yoke in the pressing plane.

4,399,748

MULTIPLEXED HAMMER DOT BAND MATRIX PRINTER

William D. Thorne, Wake Forest, N.C., assignor to International Business Machines Corp., Armonk, N.Y.

Filed Dec. 21, 1981, Ser. No. 333,092
Int. Cl.³ B41J *3/00, 7/70*
U.S. Cl. 101—93.04 **4 Claims**



1. In a moving dot band and fixed hammer bank dot matrix printer having a hammer position defined as the spacing from center to center between two consecutive dot font elements of like size on said dot band, the improvement comprising:

two adjacent hammer mechanisms assigned to said hammer position, each covering one half of said hammer position and having a hammer face pitch equal to one half of the dot font pitch between same size dots on said band with each said hammer being provided with a separate electrical actuation mechanism;

means for ordering the operation of said electrical actuation mechanisms by even and odd groups defined by sequentially numbering all the hammers and taking the even and odd numbers as group designations;

said ordering of operation being such that only members of the even or the odd group can be operated at any time interval and only the odd or even members, respectively, can be operated in the next preceding or succeeding time intervals;

the arrangement in which said adjacent hammers have their faces vertically staggered and horizontally extended in overlapped relationship such that each hammer face overlaps a portion of each adjacent hammer's horizontal span; and

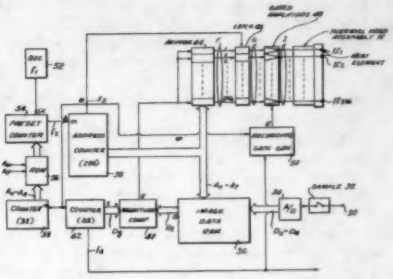
each dot font element having a hammer impact surface extending vertically so as to be operated on by either the higher or the lower vertically staggered hammer faces.

4,399,749

METHOD AND APPARATUS FOR CONTROLLING A THERMAL COLOR PRINTER

Kiyoshi Arai, Higashikurume, Japan, assignor to Sony Corporation, Tokyo, Japan

Filed Jul. 30, 1982, Ser. No. 403,795
Claims priority, application Japan, Aug. 8, 1981, 56-123588
Int. Cl.³ G01D *15/10*; **H05B** *1/00*
U.S. Cl. 101—211 **33 Claims**



1. A method of controlling a printer of the type having plural print heads for printing indicia of different colors by transferring a color dye from a dye medium to a record medium, each print head supplied with an energizing signal for a time duration that determines the relative intensity of an indicium printed thereby, said method comprising the steps of:

providing respective image signals for said print heads, each image signal representing the intensity of the indicium to be printed by a corresponding print head;

generating a successively changing intensity level representation;

comparing in a predetermined sequence said image signals to said changing intensity level representation to produce respective energizing signals, each energizing signal being produced for a duration that is determined by the value of a corresponding image signal with respect to said changing intensity level representation; and

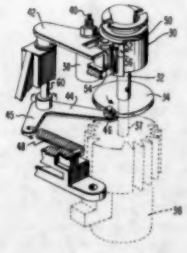
varying the duration of an energizing signal as a function of the print characteristics of the dye medium from which said print heads print said indicia.

4,399,750

CAMMING PLATEN ENDORSER

Thomas M. O'Brien, Redford, Mich., assignor to Burroughs Corporation, Detroit, Mich.

Filed Mar. 3, 1981, Ser. No. 240,204
Int. Cl.³ B41F *13/24*
U.S. Cl. 101—245 **4 Claims**



1. In a document processing machine incorporating a rotary impact endorser, the combination comprising:

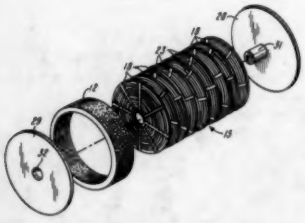
a document track bounded by two walls between which documents are driven;
said walls including openings therethrough;
a platen and a print head positioned along opposite sides of the document track and including portions which can be extended through the openings in the walls;
the print head bearing a stamp for use in providing printed endorsements to documents moving along the document track;
driving means coupled to said print head to rotate the print head between positions in which the stamp is enabled to contact a document in the track and positions in which other parts of the print head remain free of contact with a document in the track;
a cam coupled to said driving means to be revolved thereby;
a cam follower roller;
linkage means providing a coupling between the platen and the cam follower roller; and
biasing means coupled to said linkage to urge the cam follower into contact with the cam and to urge the platen toward the print head;
means to absorb landing and shear forces imparted through the linkage from said biasing means when the print head engages the platen, said means comprising a blank rubber pad forming a first portion of the face of the stamp;
said blank rubber pad serving to convert some of the energy absorbed into torque to drive the platen;
the cam follower roller being positioned by the linkage means to contact the cam during a portion of each revolution of the cam, whereby the platen is moved in and out of contact with a document in the track synchronously with the rotation of the print head to enable the stamp to provide endorsements to documents in the track and to prevent edge impact between the stamp and the platen.

4,399,751

INK ROLLER ASSEMBLY WITH CAPILLARY INK SUPPLY

John R. Kessler, West Carrollton, Ohio, assignor to Monarch Marking Systems, Inc., Dayton, Ohio

Filed Nov. 18, 1981, Ser. No. 322,463
Int. Cl.³ B41F *1/46*
U.S. Cl. 101—348 **13 Claims**



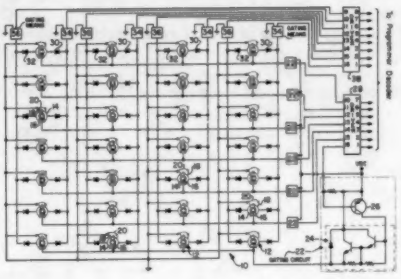
1. An ink roller assembly adapted to provide a uniform application of ink over an extended period of use, comprising a cylindrical sleeve of flexible and porous ink retaining material, a generally cylindrical ink retaining unit disposed within said sleeve, said ink retaining unit including a plurality of discs arranged in a stack, each of said discs defining a series of radially spaced and generally circumferentially extending capillary ink retaining chambers adapted to receive a supply of ink, means defining a plurality of peripherially spaced and outwardly extending capillary passages connecting said ink retaining chambers for directing a controlled flow of ink outwardly from said chambers into said sleeve, and a set of axially spaced flange members confining said stack of discs therebetween.

4,399,752

SOLID STATE SWITCH

John M. Bowyer, Copley; George W. Flower, Tallmadge, and Edward M. Maluke, Hartville, all of Ohio, assignors to Goodyear Aerospace Corporation, Akron, Ohio

Filed May 18, 1981, Ser. No. 263,970
Int. Cl.³ F42C *11/00*
U.S. Cl. 102—217 **10 Claims**



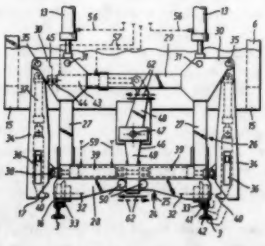
8. In an apparatus for energizing electroexplosive devices, the improvement comprising:
a matrix of rows and columns of transformers, each having a center-tap primary winding and a second winding in inductive communication therewith;
a bridge wire of a uniquely associated electro-explosive device connected across each said secondary winding;
a plurality of first gating means, one connected in common to the center tap of said primary windings of all transformers in a common row, for selectively applying a voltage level to the center tap of all transformers in such row; and
a plurality of second gating means, one connected in common across said primary windings of all transformers in a common column, for completing a current path through the associated primary windings.

4,399,753

MOBILE TRACK CORRECTION MACHINE

Josef Theurer, Vienna, and Johann Pichler, Strassham, both of Austria, assignors to Franz Plasser Bahnbaumaschinen Industriegesellschaft mbH, Vienna, Austria

Filed May 7, 1981, Ser. No. 261,571
Claims priority, application Austria, Jun. 2, 1980, 2918/80
Int. Cl.³ E01B *33/02*
U.S. Cl. 104—7 B **10 Claims**



1. A mobile track correction machine mounted for mobility on the rails of the track and comprising
(a) a machine frame,
(b) a vertically adjustable tool carrier guided along the track,
(c) track lining and lifting tools mounted on the carrier and engageable with the track rails,

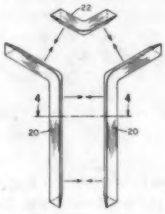
(d) power drive means linking the tool carrier to the machine frame, the power drive means including
(1) a lining drive linking the tool carrier to the machine frame and extending substantially vertically above the lining tools and the tool carrier, and
(e) a force-transmitting lever arrangement extending in a vertical plane and operable to reciprocate transversely to the track, the lever arrangement connecting the lining drive to the tool carrier and having a lower portion adjacent the tool carrier extending substantially perpendicularly to the track in a rest position of the lever arrangement, the lever arrangement comprising
(1) a two-armed lever having a lower lever arm forming the lower portion and
(2) entrainment elements mounted on the tool carrier and operable in the directions of reciprocation, the lower lever arm being glidingly received by the entrainment elements for connecting the lever to the carrier.

4,399,754

LAMINATED WOOD CORNER STRUCTURE FOR FURNITURE

Francis Emery, Atlanta, Ga., assignor to C I Designs, Inc., Medford, Mass.

Filed Aug. 28, 1981, Ser. No. 297,226
Int. Cl.³ A47B *3/06*
U.S. Cl. 108—159 **15 Claims**



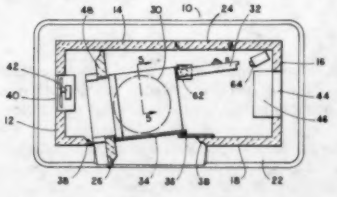
1. A corner construction for erecting furniture comprising two laminated wood legs bent at a 90° angle, cut on an angle throughout their lengths, and joined together, the angle between the upper bent portions of the legs being less than 180°, and a laminated wood connecting piece bent at a 90° angle, cut on an angle throughout its length and affixed between the upper bent portions of the two legs.

4,399,755

STRUCTURE FOR AUTOMATIC TELLER MACHINE

Paul R. Wiedmann, Sewickley, Pa., assignor to Bank Building & Equipment Corporation of America, St. Louis, Mo.

Filed Aug. 13, 1981, Ser. No. 292,663
Int. Cl.³ G07F *5/00*
U.S. Cl. 109—2 **15 Claims**



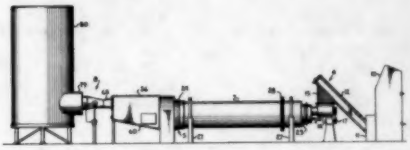
1. A structure comprising walls, a base and a roof; a component mounted upon the base adjacent to an opening in one of said walls, which component is rotatable between an operative position and a servicing position; a first panel affixed to the rotatable component so as to close the opening in said wall when the rotatable component is in the operative position; a door in one of the walls to permit entry into the structure and an automatic teller machine having customer-operated controls mounted upon the rotatable component so that the customer-operated controls are accessible through said first panel when the rotatable component is in the operative position and are inaccessible to the customer when the rotatable component is in its servicing position.

4,399,756

REFUSE BURNING PROCESS

Ia Clede Lientz, P.O. Box 430, Branson, Mo. 65616

Division of Ser. No. 231,163, Feb. 3, 1981, Pat. No. 4,338,868.
This application Jan. 18, 1982, Ser. No. 339,860
Int. Cl.³ F23D *1/00*; F23G *5/06*
U.S. Cl. 110—346 **4 Claims**



1. A method of combusting refuse and polyvinyl chloride which produces phosgene upon burning above a temperature of approximately 1300 degrees F. comprising the steps of:
(a) introducing said refuse and said polyvinyl chloride into a combustion chamber;
(b) restricting access of oxygen to said combustion chamber;
(c) igniting said refuse and said polyvinyl chloride within said combustion chamber with a deficiency of oxygen as compared to the amount of oxygen to produce complete combustion of said refuse;
(d) maintaining the temperature of said refuse and said polyvinyl chloride in said combustion chamber in a range substantially below 1300 degrees F. and above 300 degrees F. by controlling the amount of oxygen which is allowed to enter said combustion chamber;
(e) removing non-combusted refuse from said combustion chamber; and
(f) removing a gaseous stream being relatively high in combustible components from said combustion chamber;
(g) whereby phosgene is substantially not produced by the combustion of said refuse and said polyvinyl chloride.

4,399,757

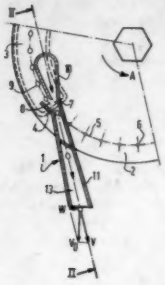
SEEDING MACHINE WITH A PNEUMATIC SEED EJECTING MEANS, ESPECIALLY FOR VEGETABLE CULTURE

Jean-Pierre Maury, Montereau, France, assignor to Nodet - Gougis, Montereau, France

Filed Apr. 1, 1981, Ser. No. 249,969
Claims priority, application France, Apr. 4, 1980, 80 07775
Int. Cl.³ A01C *7/04, 7/20*
U.S. Cl. 111—34 **8 Claims**

1. A seeding machine of the pneumatic ejecting type, especially intended for sowing light seeds such as vegetable seeds, said seeding machine including an apertured distributor disk (2) for carrying seeds, adapted to rotate in front of a suction chamber (3) located on one side of said disk (2) and interrupted in a releasing zone, and an ejection venturi (1) directed towards the ground and juxtaposed to the other side of said distributor disk (2), the convergent section of said venturi being connected to a source of compressed fluid, the neck (7) of said venturi having an inlet port (8) for the seeds carried and held by said distributor disk (2), said port (8) being located in said releasing

zone, and the venturi neck (7) is so disposed with respect to said suction chamber (3) that, when said seeds are released



from said distributor disk (2) they already lie substantially in the venturi neck (7).

4,399,758

MECHANISM FOR IMPROVING TUFTING MACHINE NEEDLE BAR SHIFTING

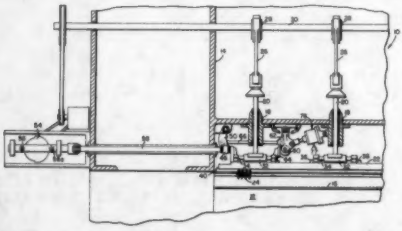
Arthur F. Bagnall, Whitefield, England, assignor to Spencer Wright Industries, Inc., Chattanooga, Tenn.

Filed Mar. 19, 1981, Ser. No. 245,376

Claims priority, application United Kingdom, Mar. 21, 1980, 8009665

Int. Cl.[3] D05C *15/00*

U.S. Cl. 112—79 R 6 Claims



1. In a tufting machine having a reciprocating needle bar carrying a plurality of needles spaced transversely across the machine adapted to penetrate a base material moving longitudinally thereof to insert a plurality of stitches upon each penetration of the base material, means for mounting said needle bar for transverse movement relative to said base material, and drive means for providing a controlled transverse displacement of the needle bar in at least one direction, the improvement comprising biasing means for urging said needle bar in a direction oppositely to said one direction in opposition to said drive means, said biasing means comprising an abutment on said needle bar, a bracket pivotably mounted in said tufting machine, a follower carried by said bracket and disposed for engagement with said abutment, and resilient means for acting on said bracket to maintain engagement of said follower with said abutment.

4,399,759

INPUT SELECTOR FOR AN ELECTRONIC SEWING MACHINE

Bengt A. Bergvall, Huskvarna, Sweden, assignor to Husqvarna Aktiebolag, Huskvarna, Sweden

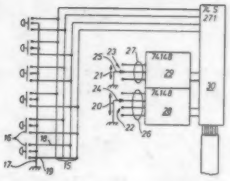
PCT No. PCT/SE80/00328, § 371 Date Aug. 6, 1981, § 102(e) Date Aug. 6, 1981, PCT Pub. No. WO81/01718, PCT Pub. Date Jun. 25, 1981

PCT Filed Dec. 10, 1980, Ser. No. 293,630

Claims priority, application Sweden, Dec. 11, 1979, 7910200

Int. Cl.[3] D05B *3/02*

U.S. Cl. 112—158 E 7 Claims



1. In an input selector for an electronic sewing machine provided with addressing and activating circuits and a memory unit for production of stitch codes for carrying out pattern seams by the stitch forming instrumentalities of the machine; the improvement wherein the selector comprises a set of electric switches with multi-pole contacts and connected to produce binary codes on a wire group coupled to said addressing circuits and memory, there being at most the same number of wires in said wire group coupled to the poles of any of said switches as the number of poles in the respective switch.

4,399,760

SEWING MACHINE FOR FANCY SEAMS

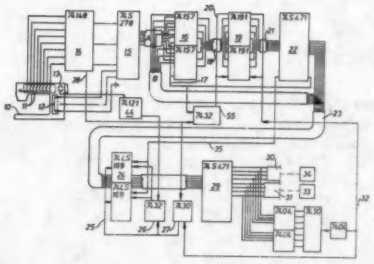
Bengt A. Bergvall, Huskvarna, Sweden, assignor to Husqvarna Aktiebolag, Huskvarna, Sweden

Filed Oct. 23, 1981, Ser. No. 314,362

Claims priority, application Sweden, Oct. 30, 1980, 8007658

Int. Cl.[3] D05B *3/02*

U.S. Cl. 112—158 E 8 Claims



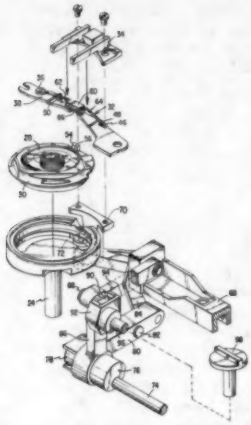
1. In a sewing machine for sewing fancy seams and having means for positioning the needle and/or the cloth feeder, a stitch memory connected to apply stitch codes representing at least one fancy seam to said positioning means, an address counter connected to address said stitch memory, pulse generator means responsive to operation steps in said machine and connected to control said address counter, said machine further having a pattern selection means for producing seam selection codes; the improvement wherein said address counter is reversible, and further comprising a seam instruction memory responsive to said seam selection code and connected to apply a seam element code and counting direction instructions to said address counter.

4,399,761

RESILIENT BOBBIN THREAD PULL-OFF MEMBER FOR LOCKSTITCH SEWING MACHINE

Gerald J. Creed, Rahway, and Thaddeus J. Zyibert, Morris Plains, both of N.J., assignors to The Singer Company, Stamford, Conn.

Filed Jul. 13, 1981, Ser. No. 282,306
Int. Cl.³ D05B 49/00, 27/02
U.S. Cl. 112—242 6 Claims



1. In a lockstitch sewing machine, mechanism for removing lengths of thread from a bobbin for use in the formation of stitches in material moved under a needle by a feed dog having vertical components of movements perpendicular to the work feeding direction, said mechanism including: fixed spaced walls between the bobbin spool and needle; and an elongate resilient member having one end fixed, said member being disposed to extend under the feed dog for engagement by the feed dog during downward movement thereof resulting in the flexure of the member and at least a portion of the member moving downwardly in the space between the fixed walls to pull thread, directed under the said member and over the walls, from the bobbin spool and into the space between the walls, said member being movable away from the thread upon relaxation thereof during upward movement of the feed dog, the spaced walls being located on a bobbin case which rotatably supports the bobbin and which is restrained against movement in a looptaker by a fixed member having the said one end of the elongate resilient member secured thereon, the other end of the resilient member being guided in a through opening in the fixed member.

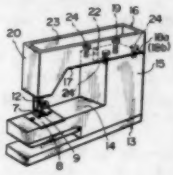
4,399,762

SEWING MACHINE HOUSING STRUCTURE

Susumu Hanyu, Hachioji, Japan, assignor to Janome Sewing Machine Co. Ltd., Tokyo, Japan

Filed Jul. 17, 1981, Ser. No. 284,447
Claims priority, application Japan, Jul. 21, 1980, 55-98670
Int. Cl.³ D05B 73/00
U.S. Cl. 112—259 4 Claims

1. A housing structure of a sewing machine, comprising a machine bed part including a flat face carrying thereon a needle plate with a needle drop hole and a hollow standard projected upwardly from said flat face, said standard having an upper end formed with a first juncture edge provided therearound of the upper end; a machine arm part adapted to be connected to the machine bed part, said machine arm part being horizontally extended from the upper end of the standard and overhanging said flat face of the machine bed part, said arm part terminating with a bracket for supporting a needle which is vertically reciprocated into and out of the needle drop hole of the needle plate in operation of the sewing machine, said machine arm part having a bottom formed with an opening provided at a part of said bottom, said machine arm part being further formed with a second juncture edge provided around said opening, said second juncture edge being oppositely arranged against said first juncture edge in assembly; first fastening means initially screwed halfway into the first juncture edge through the second juncture edge and allowing the machine arm part to be turned therearound; ad-



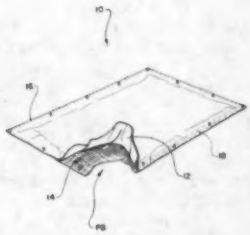
justing means including an eccentric element to be inserted into the first and second juncture edges, said eccentric element being rotated to turn the machine arm part about the first fastening means with respect to the machine bed part to positionally adjust the machine arm part with respect to the machine bed part; and a plurality of second fastening means each threaded into the first juncture edge after the machine arm part has been positionally adjusted with respect to the machine bed part by rotation of the eccentric element.

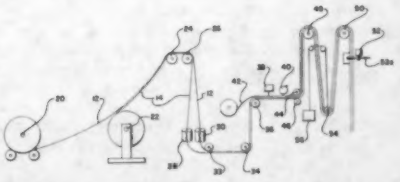
4,399,763

METHOD OF MAKING DUAL-PLY PLANT BED COVER

Marvin C. Alexander, 11th and Sycamore Sts., Weldon, N.C. 27890

Continuation-in-part of Ser. No. 101,756, Dec. 10, 1979, abandoned. This application May 14, 1981, Ser. No. 263,585
Int. Cl.³ D05B 97/00
U.S. Cl. 112—262.3 4 Claims





1. A method of forming a dual-ply plastic-cloth type plant bed cover, comprising the steps of: pulling a plastic sheet having two side edges from a roll of plastic; pulling a cloth type sheet having two side edges from a roll of cloth; directing the plastic and cloth type sheets together in relatively closed

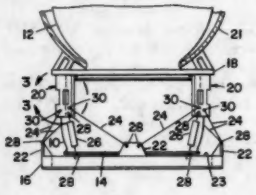
back-to-back relationship and pulling the two sheets together over at least one idler; directing each of the two sheets through centering control means for maintaining the respective sheets in alignment with each other and continuing to pull said sheets through said centering control means; feeding a relatively narrow tape cloth onto both sides of the two sheets; directing the two sheets and tape cloth strips to a dual head stitching system and aligning the tape cloth strip and adjacent plastic and cloth type sheets on one side with one stitching head and aligning the tape cloth strip and adjacent plastic and cloth sheets about the other side with the other stitching head; pulling the tape cloth strips and adjacent plastic and cloth type sheets through said stitching heads; stitching the tape cloth strip and adjacent plastic and cloth sheets together about both sides to form a dual-ply plastic-cloth plant bed cover; punching anchor holes through said tape cloth strips and adjacent plastic and cloth type sheets about both sides of said dual-ply plant bed cover at selective intervals; directing the dual-ply plant bed cover to a cutting device; and cutting the fabricated dual-ply plant bed cover at selected integrals to form a fabricated and finished dual-ply plant bed covers.

4,399,764

PASSIVE SHOCK MITIGATION SYSTEM WITH SEA WATER METERING SHOCK ABSORBER

D. Darrell Menz, Cupertino, Calif., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Jul. 6, 1981, Ser. No. 280,607
Int. Cl.³ B63B *59/00*
U.S. Cl. 114—219 **14 Claims**



1. Passive apparatus for absorbing the kinetic energy of a collision to protect a structure from damage in a collision, which comprises:

(a) a shock mitigation ring for receiving impacts, said ring having an inside diameter large enough for the ring to encircle the structure in the area where the structure is to be protected;

(b) means for suspending said ring such that it is disposed between the area of said structure to be protected and the expected path of potentially impacting objects, said means for suspending comprising:

(1) a plurality of legs for supporting said ring, said legs being fixed relative to the structure and disposed symmetrically with respect to and above the area of the structure to be protected,

(2) two rigid rods connected to each of said legs, each of said rods having one end coupled pivotally to one of said legs, each of said rods being slidable through its pivot point in said one of said legs when it undergoes compressive forces, the other end of each of said rods being pivotably coupled to said ring, the length of said rods and the pivoting points relative to the ring and to the legs being chosen so that said ring is suspended between the area of the structure to be protected and the expected path of potentially impacting objects and so that the ring may swing on the pivot points in response to an impact but is prevented from striking the structure to be protected by tension forces on at least one of said rods; and

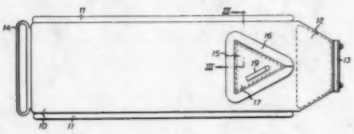
(c) means for resisting the motion of the ring as it swings in response to an impact.

4,399,765

FLOATING CONTAINER FOR RECEIVING AND TRANSPORTING COLLECTED OIL POLLUTANTS

Stig H. I. Alkner, Ystad, and Sture H. Soderstrom, Trelleborg, both of Sweden, assignors to Trelleborg AB, Trelleborg, Sweden

Filed Sep. 9, 1981, Ser. No. 300,417
Claims priority, application Sweden, Sep. 19, 1980, 8006572
Int. Cl.³ B65D *88/12*
U.S. Cl. 114—256 **8 Claims**



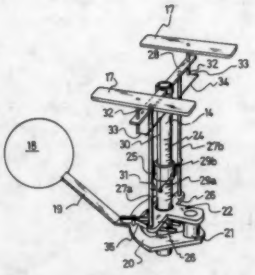
1. A floating container for receiving and transporting collected oil pollutants, said container being in the form of an elongate, hose-shaped body (**10**) of flexible, liquid-tight material and being provided with fixedly secured, inflatable buoyancy bodies (**11**) and towing attachments (**13**), wherein said hose-shaped body (**10**) has a large filling and discharge opening (**15**) surrounded by an inflatable buoyancy collar (**16**) and sealable by means of a cover (**17**), said hose-shaped body having an internal chamber for holding said collected oil pollutants, said body having an upper wall of said flexible liquid-tight material which comprises an upper wall of said internal chamber, said filling and discharge opening being formed in said upper wall to provide direct access into said internal chamber, said inflatable buoyancy collar surrounding said opening in proximity thereto to keep the opening above sea level and to keep the opening in its open state after removal of the cover.

4,399,766

FRONT WHEEL INDICATOR

Rustan W. Lenberg, Kungsportsavenyen 43, Göteborg, Sweden S 41136

Filed Jun. 17, 1981, Ser. No. 274,390
Claims priority, application Sweden, Jul. 2, 1980, 8004895
Int. Cl.³ B60Q *1/42*
U.S. Cl. 116—31 **7 Claims**



1. A hydrostatic front wheel indicator for a motor car comprising:

a liquid filled capsule having a transparent lid and means for mounting said capsule at the steering wheel of said car,

a shaft mounted in said capsule in inclined relationship to a plumb line intersecting the longitudinal axis of said shaft,

a front wheel position indicator rotatably mounted on said

shaft and including spaced-apart, parallel bands indicating wheel position,

a float in said capsule mounted for a swinging movement about said shaft, and

linkage means for transferring movements of said float to said indicator comprising, a sector lever disposed normal to and enclosing said shaft, and means to mount said sector lever for swingable movement about said shaft at a point located at a side of said shaft opposite said float.

4,399,767

VARNISHING UNIT IN THE DELIVERY UNIT OF A SHEET-FED ROTARY PRINTING PRESS

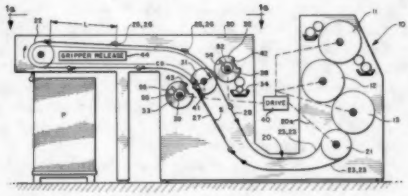
Claus Simeth, Offenbach am Main, Fed. Rep. of Germany, assignor to M.A.N.-Roland Druckmaschinen Aktiengesellschaft, Fed. Rep. of Germany

Continuation-in-part of Ser. No. 374,150, May 3, 1982, abandoned. This application Jun. 9, 1982, Ser. No. 386,656

Claims priority, application Fed. Rep. of Germany, May 6, 1981, 3117855

Int. Cl.³ B05C *11/00*

U.S. Cl. 118—46 **10 Claims**



1. An apparatus for varnishing a sheet being fed from a sheet-fed printing press unit into a delivery unit comprising, in combination, a frame, guide rails in the frame, a pair of conveyor chains laterally spaced from one another on the guide rails to form an endless loop conveyor extending from the press unit to a delivery pile, the chains having cross members at regular intervals, grippers at the cross members for gripping the leading edge of a sheet, the guide rails being arranged to form a delivery run and return run spaced apart and generally parallel to one another, an applicator cylinder journalled in the frame in a position in which it is overlapped by each of the runs but having an axial length which is shorter than the lateral spacing between the chains, means supported on the frame outside of the return run and in rolling engagement with the applicator cylinder for supplying a film of varnish thereto, a backing cylinder journalled in the frame outside of the delivery run and in rolling engagement with the applicator cylinder, the circumference of the cylinders being equal to the spacing between the successive cross members and grippers, the applicator cylinder having a longitudinal groove sufficiently large to provide free passage for the cross members and associated grippers in both the delivery run and the return run, means for driving the cylinders in synchronism with the conveyor chains so that a sheet passing on the grippers is engaged between the applicator and backing cylinders for application of varnish to the sheet.

4,399,768

APPARATUS FOR THE SURFACE TREATMENT OF AN OBJECT

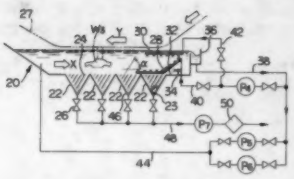
Yasuo Tokushima; Kenji Fukuta, and Yoshinobu Takahashi, all of Toyota, Japan, assignors to Toyota Jidosha Kogyo Kabushiki Kaisha, Toyota, Japan

Filed Nov. 5, 1981, Ser. No. 318,418

Claims priority, application Japan, Jan. 29, 1981, 56-12031

Int. Cl.³ C23F *7/08;* **B05C** *3/00, 19/02*

U.S. Cl. 118—423 **9 Claims**



1. An apparatus for applying a predetermined surface treatment to an object by means of dipping the object in a treating liquid and conveying said object in a direction, said apparatus comprising:

a treating vessel containing the treating liquid for performing the predetermined surface treatment;

at least one hopper of funnel shape disposed at the bottom portion of the treating vessel in which the object is dipped, said at least one hopper collecting precipitated sludge therein, the collected sludge being removed out of said at least one hopper through the lower portion thereof; and

a multiplicity of slant plates inclined in the same direction with respect to said direction of conveyance and disposed above the bottom portion of the treating vessel in spaced relation with one another so that floating sludge in the liquid may fall through the clearances between the slant plates onto the bottom portion of the treating vessel, said slant plates preventing the sludge from being stirred up into the treating liquid.

4,399,769

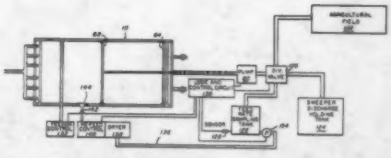
PROCEDURES FOR RAISING FISH

Robert F. Casey, 22 Duggan Rd., Acton, Mass. 01720

Continuation-in-part of Ser. No. 162,407, Jun. 24, 1980, abandoned, which is a division of Ser. No. 847,098, Feb. 1, 1978, Pat. No. 4,221,187. This application Jun. 1, 1981, Ser. No. 268,903

Int. Cl.³ A01K *61/00*

U.S. Cl. 119—3 **3 Claims**



1. A method for determining the proper amount of food for introduction into a tank of water that contains fish, comprising:

a. removing food and particulate material from said tank by means of a suction sweeper;

b. administering a pre-determined amount of food to said water;

c. allowing sufficient time for food that is not eaten by said fish to settle on the bottom of said tank;

d. removing settled food from the bottom of said tank by means of a suction sweeper;

e. determining the amount of food that is removed from said tank by said sweeper; and,

f. adjusting the amount of food administered to said tank, according to the amount of settled food that is removed by said sweeper.

4,399,770

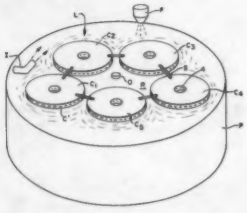
PROCESS AND APPARATUS FOR FISH GROWTH ACCELERATION

Albert H. Knowles, and Robert H. Rines, both of 13 Spaulding St., Concord, N.H. 03301

Continuation of Ser. No. 181,831, Aug. 27, 1980, abandoned. This application Mar. 22, 1982, Ser. No. 360,563

Int. Cl.³ A01K *63/00*

U.S. Cl. 119—3 **24 Claims**



1. A process for accelerating the growth of fish in a contained water volume bounded by a border at least at the surface of the water comprising providing the water volume with a plurality of light-blocking covers, each in contact with the water surface so as to form a dark area thereunder for the stacking and resting of fish, disposing the covers in the water volume in an array providing a peripheral uncovered water region between the array of covers and the border for the circulation of feed to the fish, and a central uncovered water region within the array of covers, and circulating feed past the edges of the covers in said peripheral water region.

4,399,771

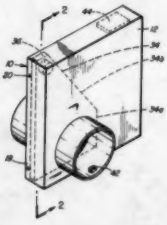
PET DOOR

Douglas G. Medley, Galiano Island, British Columbia, Canada V0N 1P0

Filed Aug. 17, 1981, Ser. No. 293,427

Int. Cl.³ E06B *3/38*

U.S. Cl. 119—19 **4 Claims**



1. A pet door assembly for mounting over an opening, comprising:

a generally rectangular box having front and rear walls, said walls having aligned apertures,

two tubular members together defining a tunnel, each member extending through one of said apertures, said members having adjacent end faces which define a parallel sided gap,

pivot means positioned within said box but outside said tunnel, and extending generally parallel to the tunnel axis,

a planar door mounted on said pivot means so as to be movable in its own plane within said gap between a closed position in which an operable portion thereof extends fully across said gap and an open position in which a pet can pass through the tunnel, the relationship of the door to the box being such that the door rotates through about 45° in moving from the closed to the open position while the operative portion thereof moves from one corner to the diagonally opposite corner of the box,

electric rotary drive means for moving the door between the open and closed positions, and

means carried adjacent an outer end of the tunnel and operable by a pet for energizing said drive means to open the door.

4,399,772

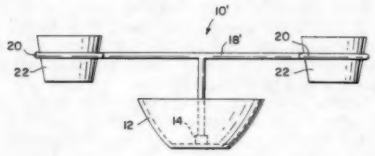
ANIMAL FEEDER

Rufus C. Salinas, 19321 Ramsey Rd., Crosby, Tex. 77532

Filed Feb. 8, 1982, Ser. No. 346,815

Int. Cl.³ A01K *5/00, 7/00*

U.S. Cl. 119—51.5 **6 Claims**



1. An animal and pet feeder, comprising:

a bottom bowl having a base for contacting a ground surface and upwardly-extending side walls to form a reservoir therein for containing a liquid such as drinking water;

a receptacle centrally disposed within said reservoir of said drinking bowl;

rod means having a bottom end sized for snug reception within said receptacle and an upper end extending upwardly and laterally from said receptacle by a predetermined horizontal distance;

support means extending laterally and outwardly from said upper end of said rod means;

an upper bowl having upwardly-extending side walls to form a reservoir therein for containing a solid such as food, said upper bowl being supported by said support means, whereby said liquid serves as a barrier against insects crawling across said bottom bowl into said upper bowl; and

said horizontal distance being such that most food particles that may be dropped outside of the side walls of said upper wall from the mouth of the animal, as it is eating the food from the upper bowl, will fall outside of the side walls of said bottom bowl, thereby reduce the water contamination in said bottom bowl which might tend to attract insects therein.

4,399,773

SOOT BLASTER

Hans Schwade, Voerde, and Karl Albers, Anholt, both of Fed. Rep. of Germany, assignors to Bergemann GmbH, Wesel, Fed. Rep. of Germany

Filed Nov. 25, 1981, Ser. No. 324,994

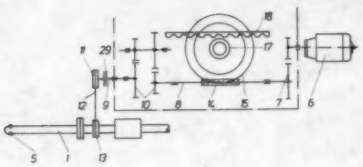
Claims priority, application Fed. Rep. of Germany, Mar. 27, 1981, 3112121

Int. Cl.³ F22B *37/52*

U.S. Cl. 122—390 **7 Claims**

1. Soot blaster, comprising: a lance tube for emission of high-velocity fluid jets; rotating means for rotating said lance tube; drive means for linearly advancing and retracting said

lance tube; at least one coupling interposed between the lance tube and one of said means; a limit switch at a forward end of the lance tube path; a time-delay relay controlled by said limit switch and connected with said coupling; said coupling being interposed between said drive means and said lance tube; and a single electric motor for operating said drive means; said coupling being disengaged for a predetermined time interval set by said time-delay relay; said single motor generating two compo-



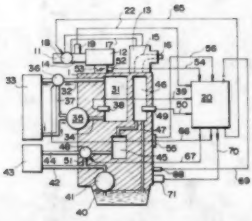
nents of motion comprising linear and rotary motions of the lance tube, said motor continuing to generate one component of motion when the other component of motion is arrested, said limit switch releasing the arrested component of motion by applying a signal through said relay to reverse the motor and thereby retract the lance tube after position of said jets has been changed, so that said coupling is temporarily disengaged and the jets define a different path, every blasting process being initiated at a different jet position.

4,399,774

APPARATUS FOR CONTROLLING TEMPERATURE OF INTERNAL COMBUSTION ENGINE

Saburo Tsutsumi, Yokohama, Japan, assignor to Nissan Motor Co., Ltd., Yokohama, Japan

Filed Jun. 24, 1980, Ser. No. 162,643
Claims priority, application Japan, Jul. 2, 1979, 54-82599
Int. Cl.³ F01P *3/20*
U.S. Cl. 123—41.1 **32 Claims**



6. An apparatus for controlling the temperature of an internal combustion engine, comprising;

a plurality of fluid temperature sensing means each for sensing the temperature of each one of different kinds of working fluids which are capable of exchanging heat with the engine,

condition detecting means for detecting the engine operating conditions,

means for finding, in response to the detected engine operating conditions, each reference temperature of said working fluids which is a function of the engine operating conditions,

controller means which compares the sensed temperature of each of said working fluids with the corresponding reference temperature to find the error therebetween and produces each control signal of said working fluids in accordance with the corresponding error,

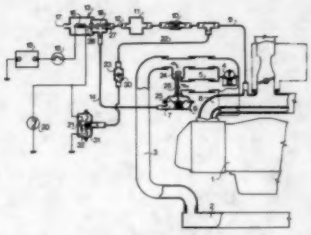
a plurality of fluid temperature regulating means each for regulating the temperature of each one of said working fluids in response to the corresponding control signal which is manipulated so as to bring the temperature of the working fluid closer to the reference temperature.

4,399,775

SYSTEM FOR CONTROLLING COOLING WATER TEMPERATURE FOR A WATER-COOLED ENGINE

Takayuki Tanaka, Komae; Noriaki Kadoi, Musashino, and Akio Yoshimoto, Mitaka, all of Japan, assignors to Fuji Jukogyo Kabushiki Kaisha, Tokyo, Japan

Filed Apr. 26, 1982, Ser. No. 371,759
Claims priority, application Japan, Apr. 30, 1981, 56-65673
Int. Cl.³ F01P *7/14*
U.S. Cl. 123—41.08 **2 Claims**



1. A system for controlling cooling water temperature for a water-cooled engine having an intake passage, a radiator, a cooling water passage communicating a water jacket in said engine with said radiator, and a thermostat provided in said cooling water passage, said thermostat being so arranged as to open said passage when the cooling water temperature exceeds a predetermined value, said system comprising

a bypass for bypassing said thermostat;

a bypass valve provided in said bypass for closing the bypass;

solenoid operated valve means for actuating said bypass valve; and

a thermo switch and a vacuum switch connected parallel to a solenoid of said solenoid operated valve means;

said thermo switch being responsive to a low cooling water temperature to effect the operation of said solenoid operated valve for closing said bypass valve of said bypass,

said vacuum switch having a vacuum chamber which is communicated with said intake passage via a restriction,

said vacuum switch being responsive to a vacuum at heavy load operation to effect the operation of said solenoid operated valve for opening said bypass valve.

4,399,776

SYSTEM FOR CONTROLLING COOLING WATER TEMPERATURE FOR A WATER-COOLED ENGINE

Makoto Shikata, Musashimurayama, Japan, assignor to Fuji Jukogyo Kabushiki Kaisha, Tokyo, Japan

Filed Apr. 26, 1982, Ser. No. 371,760
Claims priority, application Japan, May 1, 1981, 56-67223
Int. Cl.³ F01P *7/14*
U.S. Cl. 123—41.08 **2 Claims**

1. In a system for controlling cooling water temperature of a water-cooled engine having an intake passage, a radiator, a water jacket having an inside water passage provided in said engine for cooling the engine, a water passage for communicating said inside water passage with said radiator, a thermostat provided in said water passage, and a pump causing the cooling water in said inside water passage to flow, said thermostat being so arranged as to open outside water passage when the water temperature exceeds a predetermined value, the improvement comprising

a bypass connected between an outlet of said water jacket and an inlet of said pump;

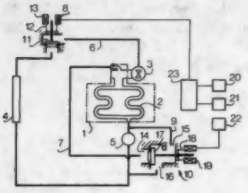
a circulation pipe connected between said outlet and inlet of said pump;

changeover valve means provided for selectively connecting said outside water passage and said circulation pipe with said inlet;

first actuator means for actuating said changeover valve;

flow control valve means provided in said outside water passage for controlling flow rate of the water;

second actuator means for actuating said flow control valve;



thermo-switch means provided on the engine for operating said first actuator of said changeover valve for communicating said bypass with the inlet of said pump at a predetermined water temperature;

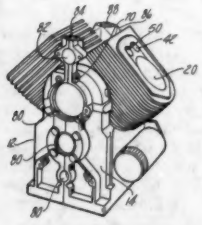
means for detecting engine operation and for operating said second actuator of said flow control valve for controlling the flow rate of water at a water temperature higher than said predetermined water temperature.

4,399,777

ENGINE BLOCK

Ronald W. Hoettels, Colgate, Wis., assignor to Teledyne Industries, Inc., Milwaukee, Wis.

Filed Aug. 17, 1981, Ser. No. 293,274
Int. Cl.³ F02B *75/22*
U.S. Cl. 123—55 R **9 Claims**



1. An engine block for an internal combustion engine comprising:

a pair of substantially identical block halves, each block half having a mating surface symetrical about a center line formed around the outer periphery on one side and a cylinder adapted to slidably receive a piston,

a pair of passageways formed in each block half, said passageways being adapted for connection at one end to said cylinder and open at their other ends to said mating surface on opposite sides of said center line, said other ends of said passageways being equidistantly spaced from said center line and transversely aligned with each other,

a pair of channels recessed in the mating surface of each block half, one channel extending between each end of said passageways being in communication therewith and to the outer edge of said mating surface,

means for securing said block halves together so that said mating surfaces abut together and so that said channels on one block half register with said channels on the other block half, and

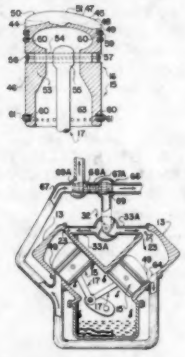
wherein one pair of registering channels forms a fuel/air intake port for the engine block while the other pair of registering channels forms an exhaust outlet for the engine block.

4,399,778

TWO CYCLE INTERNAL COMBUSTION ENGINE

Antonio Ancheta, 488 Toronto St., Winnipeg, Manitoba, Canada R3G 1S6

Filed Jan. 18, 1982, Ser. No. 340,507
Int. Cl.³ F02B *29/08, 30/00, 75/02*
U.S. Cl. 123—65 VB **17 Claims**

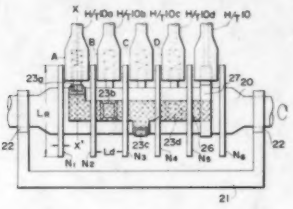


1. A two-stroke supercharged multi-cylinder internal combustion engine, with inline or V-type configuration and including a pressure lubrication system; comprising in combination a cylinder block having cylinder bores formed therein, a cylinder head on the upper end of the cylindrical bores and closing same and defining a combustion chamber at the upper end of each cylindrical bore, a piston assembly in each of said bores including a piston having a domed head and a connecting rod operatively connected to said piston for reciprocating same between top dead centre and bottom dead centre, a crankshaft mounted for rotation at the base of said block, said connecting rods being operatively connected to said crankshaft and an oil pan enclosing the lower end of the cylinder bores and said crankshaft, said cylinder head including a cam shaft mounted for rotation thereon and being operatively connected to said crankshaft, at least one inlet-and-scavenger valve mounted on said cylinder head and being operatively connected with said combustion chamber of each of said cylindrical bores, a rocker arm operatively mounted on said cylinder head and operatively engaging said inlet-and-scavenger valve by one end thereof, a cam lobe for each rocker arm formed on said cam shaft operatively connected with the other end of said rocker arm, said cam lobes having a relatively wide area of contact with said rocker arm to control the opening, closing and duration of opening of said inlet-and-scavenger valve and exhaust port located in the lower side of the cylinder walls of the cylinder bores inclining downwardly and outwardly through the cylinder walls and being covered and uncovered by the reciprocating piston passing thereby.

4,399,779
DISTRIBUTOR WITH SLIDING CONTACTS

Hiroshi Endo, Yokosuka, and Kousaku Baba, Yokohama, both of Japan, assignors to Nissan Motor Co., Ltd., Yokohama, Japan

Filed Jul. 22, 1981, Ser. No. 286,181
Claims priority, application Japan, Jul. 23, 1980, 55-99829
Int. Cl.³ F02P 1/00
U.S. Cl. 123—146.5 A 6 Claims



1. An ignition distributor for an ignition system for an internal combustion engine, comprising:

a shaft formed of electrically insulating material rotatable about its axis;

a rotor output terminal disposed within said shaft, said rotor output terminal including a plurality of contact surfaces extending to an outer surface of said shaft;

a plurality of stationary brushes circumferentially disposed about the axis of said shaft and arranged to slidingly contact with the corresponding one of said contact surfaces, respectively, said brushes each being disposed within an insulating housing defined at the end of a high tension cord; and

a plurality of separators mounted on said shaft, each separator being arranged to extend from said shaft so as to terminate between two adjacent insulating housings to thereby separate the points of contact between said brushes and said contact surfaces.

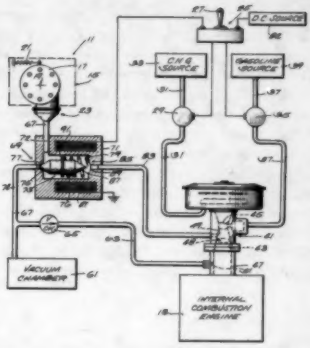
4. An ignition distributor as claimed in claim 1, wherein said separators are mounted on said shaft so as to be rotatable with respect thereto and held stationary within said distributor.

4,399,780
SPARK ADVANCE CONTROL MECHANISM FOR DUAL FUEL ENGINE

George G. Lassanske, Oconomowoc, and Arthur G. Poehlman, West Bend, both of Wis., assignors to Outboard Marine Corporation, Waukegan, Ill.

Filed Oct. 23, 1981, Ser. No. 314,227
Int. Cl.³ F02P 5/08, 5/10
U.S. Cl. 123—146.5 A 3 Claims

1. A spark advance control mechanism for an engine capable of being selectively operated on a first fuel and on a second fuel, said mechanism comprising an air induction passage having therein a movable throttle plate and communicating with the engine, a member electrically connected to the engine for timing of the sparking thereof and movable between a first position providing retarded sparking and a second position providing advanced sparking, means biasing said member for movement from said second position toward said first position, a vacuum actuated motor operable to displace said member from said first position toward said second position in response to application to said vacuum motor of an increasing amount of vacuum, a vacuum chamber, first conduit means communicating with said air induction passage downstream of such throttle plate for providing a vacuum in said vacuum chamber in response to engine operation and including check valve means affording fluid flow from said vacuum chamber to said manifold and preventing fluid flow from said manifold to said vacuum chamber, second conduit means communicating between said vacuum chamber and said vacuum motor and including first control valve means movable between a normally closed position and an open position, third conduit means communicating between said air induction passage and said vacuum motor and including second control valve means movable between a normally open position and a closed position, and

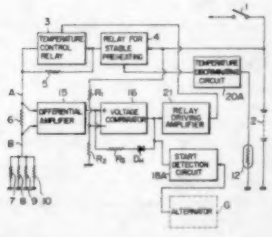


operator controlled means connected to said first and second control valve means for opening said first control valve means and closing said second control valve means when the engine is operating on gaseous fuel, and for permitting closing of said first valve means and opening of said second valve means when the engine is operating on liquid fuel.

4,399,781
ENGINE PREHEATING CONTROL SYSTEM HAVING AUTOMATIC CONTROL OF GLOW PLUG CURRENT

Hidaka Tsukasaki, Kariya, Japan, assignor to Nippondenso Co., Ltd., Kariya, Japan

Filed Jan. 29, 1981, Ser. No. 229,632
Claims priority, application Japan, Jan. 31, 1980, 55-11287; Mar. 12, 1980, 55-31827
Int. Cl.³ F02P 19/02
U.S. Cl. 123—179 H 13 Claims



1. An engine preheating control system for preheating of an engine before starting of a starter motor, said system comprising:

a switch for initiating the preheating of the engine;

engine preheating glow plugs each including a heat generator having a predetermined temperature coefficient of resistance;

a stable preheating resistor for reducing the current applied to said glow plugs;

a power supply;

switching means including relays for controlling supply of current to said plugs and defining a first path for supplying current from said power supply to said glow plugs without the agency of said stable preheating resistor and a

second path for supplying current from said power supply through said stable preheating resistor to said glow plugs, said first and second current supply paths being switched over from one to the other;

current detecting means for producing a current detection signal proportional to the current flowing through said glow plugs; and

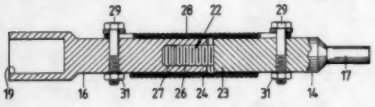
control means for controlling said current supply path switching means to selectively switch said first and second current supply paths in response to said current detection signal in order to supply current to said glow plugs through said first path to raise the temperature of said plugs up to a first predetermined value, thereafter to supply current to said glow plugs through said second path wherein said stable preheating resistor defines the supplied current to gradually lower the temperature of said plugs from the first predetermined value to a second predetermined value and thereafter to supply current to said glow plugs again through said first path, the selective switching of said first and second paths being initiated by said switch being actuated before starting of the engine.

4,399,782

DEVICE FOR STARTING INTERNAL COMBUSTION ENGINES

Jack W. Shelley, Rte. 2, Headland, Ala. 36345

Filed Sep. 21, 1981, Ser. No. 303,967
Int. Cl.³ F02N *11/12*
U.S. Cl. 123—179 SE **1 Claim**



1. A device for transmitting power from a power driving unit to a driven member of an internal combustion engine comprising:

(a) a first shaft-like power transmitting member having one end adapted to be detachably connected to said power driving unit,

(b) a second shaft-like power transmitting member in axial alignment with said first shaft-like power transmitting member with one end thereof adapted to be detachably connected to said driven member with the other ends of said first and second power transmitting members defining adjacent end portions,

(c) a reduced diameter externally threaded end portion on one of said adjacent end portions in threaded engagement with a threaded opening in the other of said adjacent end portions and defining a shoulder in position to move toward and abut the end of said other of said adjacent end portions and transfer power from said driving unit to said driven member in response to relative rotation of said adjacent end portions in one direction and to move away from the end of said other of said adjacent end portions in response to relative rotation of said adjacent end portions in the opposite direction, and

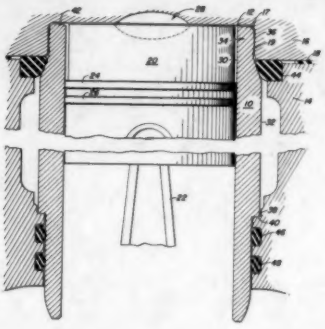
(d) resilient means operatively connecting said first and said second power transmitting members to each other to define a shock absorber between said power driving unit and said driven member.

4,399,783

INTERFERENCE FIT CYLINDER LINER

Herbert J. Hauser, Jr., Waterloo, Iowa, assignor to Deere & Company, Moline, Ill.

Continuation of Ser. No. 139,984, Apr. 14, 1980, abandoned. This application Mar. 8, 1982, Ser. No. 356,014
Int. Cl.³ F02F *1/18*
U.S. Cl. 123—193 CH **10 Claims**



1. In an internal combustion engine having a cylinder block with an opening formed therein, a cylinder liner fitted throughout a substantial portion of its entire length in said opening of said cylinder block to form a cylindrical bore, and a cylinder head mounted to said cylinder block to close one end of said cylindrical bore, said cylinder head having a circular pocket with a circumferential side surface into which extends a portion of said cylinder liner, wherein the improvement comprises:

(a) an interference fit cylinder liner including a hollow cylindrical member with an interior surface of substantially uniform diameter and a contoured exterior surface, said cylindrical member having a thin wall formed at an end thereof which has a contact surface and contact free surfaces, said contact surface having a circumferential convex cross-sectional profile that extends above said cylinder block into said circular pocket of said cylinder head, said contact surface being deflected inward upon contact with said circumferential side surface of said circular pocket as said cylinder head is mounted onto said cylinder block and said contact free surfaces being spaced apart from adjacent surfaces of said circular pocket forming a clearance which is free of intermediate members therebetween; and

(b) sealing means for preventing combustion gases from passing between said cylinder block and said cylinder head, said sealing means contacting said exterior surface of said cylindrical member adjacent to said contact surface.

4,399,784

INTERNAL COMBUSTION ENGINE

James E. Foley, WW Ranch, St. R.D. 512, Sebastian, Fla. 32958

Continuation-in-part of Ser. No. 233,298, Feb. 10, 1981. This application Apr. 17, 1981, Ser. No. 255,173
Int. Cl.³ F02D *13/06*
U.S. Cl. 123—198 F **9 Claims**

1. An internal combustion engine, having at least one cylinder, comprising:

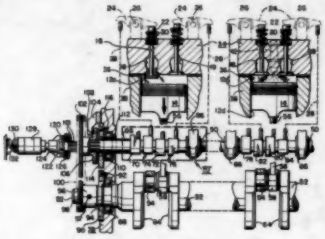
an axially displaceable cam shaft;

at least two cams fixed for rotation together with the cam shaft;

the at least one cylinder having an intake and an exhaust valve, each valve being operable by a cam-activated push rod;

the intake valve being operable by a first multiple lobe cam having at least two push rod activating lobes, one of the lobes having a first eccentric circumferential surface relative to the cam shaft axis for periodically opening and closing the intake valve over a first timing range, and the other of the at least two lobes having a second eccentric circumferential surface relative to the camshaft axis for periodically opening and closing the intake valve over a second timing range, the cam further having a transition surface on which the push rod can easily slide between adjacent lobes;

the exhaust valve being operable by a second multiple lobe cam having at least two push rod activating lobes, one of the lobes having a third eccentric circumferential surface



relative to the cam shaft axis for periodically opening and closing the exhaust valve over a third timing range, and the other of the at least two lobes having a fourth eccentric circumferential surface relative to the camshaft axis for periodically opening and closing the exhaust valve over a fourth timing range, the cam further having a transition surface on which the push rod can easily slide between adjacent lobes; and,

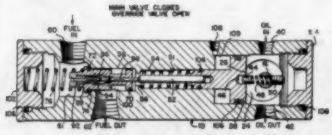
the respective lobes of the multiple lobe cams being selectively positionable to engage and activate the push rods through axial displacement of the cam shaft during operation of the engine, whereby the timing ranges of the intake and exhaust valves may be selected, without interfering with operation of the engine, to improve efficiency and gas mileage at different engine speed ranges.

4,399,785

ENGINE PROTECTIVE DEVICE RESPONSIVE TO LOW OIL PRESSURE

J. T. Mills, Houston, Tex., assignor to Sentinel Manufacturing Company, Incorporated, Denver, Colo.

Filed Aug. 25, 1981, Ser. No. 296,193
Int. Cl.³ F02B 77/08
U.S. Cl. 123—198 DB 30 Claims



1. An apparatus for controlling the flow of fuel in a fuel supply line of an internal combustion engine in response to pressure in the engine's lubricating system, comprising:

(a) a body having a main fuel passageway therein;

(b) a fuel inlet port and a fuel outlet port, each port communicating with said passageway and adapted to be connected to the fuel supply line of an internal combustion engine;

(c) a lubricant pressure sensor for sensing the pressure in the engine's lubricating system;

(d) a main valve in said main fuel passageway for controlling the normal flow of fuel between said fuel inlet port and said fuel outlet port, said main valve closing when the lubricant pressure sensor indicates that the pressure in the engine's lubricating system is below a predetermined value P1;

(e) a main valve operator for maintaining said main valve in an open position as long as the lubricant pressure sensor indicates that the pressure in the engine's lubricating system is above the predetermined value P1;

(f) a bypass fuel passageway in said body, bypassing that portion of said main fuel passageway controlled by said main valve, to allow a predetermined restricted amount of fuel from said fuel inlet port to said fuel outlet port;

(g) a normally closed bypass valve selectively blocking said bypass fuel passageway, and;

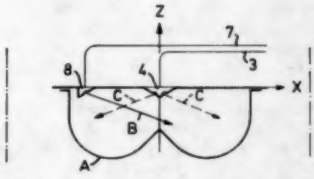
(h) a manually-operable bypass valve actuator remote from said main body and connected to said bypass valve by a control line and wherein said portion of said main fuel passageway controlled by said main valve is separated from said bypass fuel passageway by a portion of said main body and said bypass valve will close unless said manually-operable bypass valve actuator is continually actuated to hold said bypass valve open.

4,399,786

METHOD FOR PILOT INJECTION OF FUEL IN DIESEL ENGINES

Heinz E. A. Holmer, Gothenburg, Sweden, assignor to AB Volvo, Gothenburg, Sweden

Division of Ser. No. 962,031, Nov. 15, 1978, Pat. No. 4,273,084.
This application Aug. 25, 1980, Ser. No. 181,241
Claims priority, application Sweden, Nov. 23, 1977, 7713231
Int. Cl.³ F02B 3/06
U.S. Cl. 123—301 11 Claims



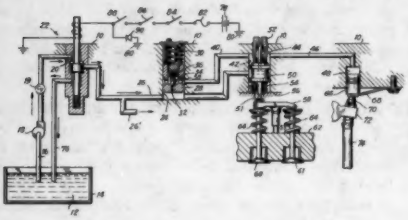
1. In a fuel injection method for direct injection diesel engines with a depression in the tops of the pistons, in which a first injection pump with a regulator and accompanying first injector for each cylinder sprays fuel with a relatively low cetane number in a main spray in a zone around the center axis of the respective piston depression; the improvement comprising injecting a pilot spray of a fuel with a relatively high cetane number from a second injection pump (6) with a regulator and accompanying second injectors (8) for each cylinder, from the side into the respective piston depression in a direction (B) toward a central zone in the piston depression in which the intake air rotates, operating both of said injection pumps during a combustion cycle, and injecting said pilot spray before said main spray so that the compression combustion of the fuel from the second injection pump (6) can initiate the combustion of the fuel from the first pump (1).

4,399,787

ENGINE RETARDER HYDRAULIC RESET MECHANISM

Mark S. Cavanagh, Holyoke, Mass., assignor to The Jacobs Manufacturing Company, Bloomfield, Conn.

Filed Dec. 24, 1981, Ser. No. 334,265
Int. Cl.³ F02D 9/06
U.S. Cl. 123—321 25 Claims



1. In an engine retarding system of a gas compression relief type including an internal combustion engine having exhaust valve means and pushrod means, hydraulically actuated first piston means having high and low pressure sides associated with said exhaust valve means to open said exhaust valve means at a predetermined time and moveable between first and second positions, second piston means actuated by said pushrod means and hydraulically interconnected with said first piston means, adjustable stop means disposed in abutment with said first piston means when said first piston means is in said first position, and control valve means having high and low pressure sides hydraulically interconnected with said first and second piston means at the high pressure side thereof, the improvement comprising an hydraulic reset mechanism operable in response to first and second pressure conditions, said hydraulic reset mechanism comprising a passageway communicating at one end with said high pressure side of said first piston means and communicating at the opposite end with said low pressure side of said first piston means, pin valve means mounted for coaxial movement with respect to said first piston means and adapted to contact said passageway at the high pressure end thereof so as to seal off said passageway, first spring means adapted to bias said pin valve means toward said high pressure end of said passageway, second spring means adapted to engage said pin valve means and to bias said pin valve means away from said high pressure end of said passageway when said pin valve means is in contact with said high pressure end of said passageway and said first piston means has moved to a point in the range of location between said second position and intermediate said first and said second positions and said exhaust valve means has opened so as to produce said second pressure condition and means to equalize the pressure at the locations of said first and second spring means.

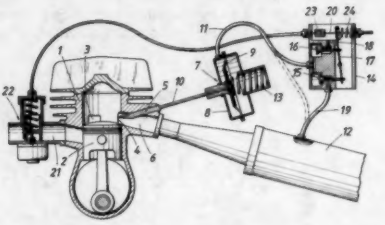
23. In a process for operating a compression relief engine retarder comprising hydraulically driving a piston means from a first to a second position to open mechanically an engine exhaust valve near the end of each compression stroke of the engine cylinder with which said exhaust valve is associated, the steps of sensing the decreased cylinder pressure following each opening of said exhaust valve by said piston means after the compression relief function has been completed, releasing the hydraulic pressure acting upon said piston means in response to said decreased cylinder pressure, and mechanically returning said piston means to a rest position intermediate said first and second positions whereby said exhaust valve is closed prior to the beginning of each exhaust stroke of the said engine cylinder.

4,399,788

INTERNAL COMBUSTION ENGINE COMPRISING MEANS FOR CONTROLLING THE AXIAL EXTENT OF AN EXHAUST PORT IN A CYLINDER

Willy Bostelmann, Wels, Austria, assignor to Bombardier-Rotax Gesellschaft mbH, Gunskirchen, Austria

Filed Mar. 8, 1982, Ser. No. 355,913
Claims priority, application Austria, Apr. 2, 1981, 1528/81
Int. Cl.³ F02D 9/06, 7/00
U.S. Cl. 123—323 7 Claims



1. In a two-stroke cycle internal combustion engine comprising

an exhaust system,

cylinder structure having an inside peripheral surface which defines a cylinder bore and is formed with an exhaust port, which has an axial extent along the axis of said cylinder bore and communicates with said exhaust system,

a piston, which is axially reciprocable in said cylinder bore and adapted to open and close said port,

a restricting member, which is mounted in said cylinder structure adjacent to said port and adjustable between a full-flow position, in which said restricting member exposes said exhaust port throughout its axial extent, and a restricting position, in which said restricting member restricts the axial extent of said exhaust port, and

a positioning drive operatively connected to said restricting member and operable to adjust said restricting member between said full-flow and restricting positions,

said engine being operable to develop an exhaust gas pressure in said exhaust gas system,

the improvement residing in that

said positioning drive is adapted to be controlled in dependence on the exhaust gas pressure in said exhaust gas system.

4,399,789

WARM UP CONTROL SYSTEM FOR AN INTERNAL COMBUSTION ENGINE

Tsuneomi Yano, Tokyo, Japan, assignor to Nissan Motor Company, Limited, Kanagawa, Japan

Filed Feb. 6, 1981, Ser. No. 232,406
Claims priority, application Japan, Jul. 2, 1980, 55-13961
Int. Cl.³ F02D 1/04; F02M 51/06; F02D 9/02
U.S. Cl. 123—340 12 Claims

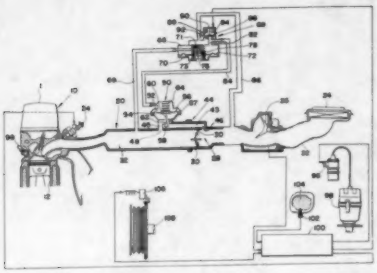
1. A warm up control system for an internal combustion engine comprising:

an engine temperature sensor for determining engine temperature and generating a temperature signal having a signal value proportional to the determined engine temperature;

a crank angle sensor detecting crank revolution angle per each predetermined angle and generating a crank angle signal per the predetermined angle of crank shaft revolution;

a controller receiving said temperature signal and said crank angle signal and determining a target engine speed, a target engine warm up rate based on the temperature signal indicative of the determined engine temperature, and determining a control signal for controlling idle air

flow rate and thereby for controlling the engine speed and a spark advance of the engine so that the engine operating condition is controlled to the determined target engine speed with the determined target warm up rate; maximum engine stability;



an idle air control means responsive to said control signal and varying of air flow rate flowing therethrough for controlling the engine speed to said target engine speed; and

a spark ignition device responsive to a spark signal fed from said controller at the determined spark advance angle.

4,399,790

AIR-FUEL RATIO CONTROL SYSTEM

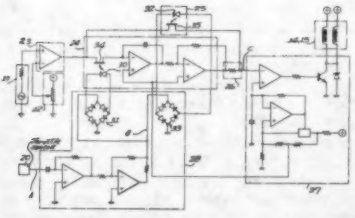
Ryuji Kataoka, Tokyo, Japan, assignor to Fuji Jukogyo Kabushiki Kaisha, Tokyo and Nissan Motor Co., Ltd., Yokohama, both of, Japan

Filed Dec. 9, 1980, Ser. No. 214,605

Claims priority, application Japan, Dec. 13, 1979, 54-162072

Int. Cl.³ F02B *33/00;* F02M *7/00*

U.S. Cl. 123—440 **7 Claims**



1. In a system for controlling the air-fuel ratio control for an internal combustion engine of the type having a carburetor with an intake passage, air-fuel mixture supply means for supplying an air-fuel mixture to the intake passage, an exhaust passage communicating with the engine, a throttle valve in the intake passage, detecting means for detecting the concentration of a constituent of exhaust gases passing through said exhaust passage and producing an output signal dependent thereon, comparator means for comparing said output signal of said detecting means with a set value and producing an output signal dependent thereon, an integrating circuit and a proportional circuit connected to said comparator means, a driving circuit connected to said integrating and proportional circuits for producing an output signal in dependency on said output signal of said integrating and proportional circuits, an electromagnetic valve means actuated by the output signal of said driving circuit for correcting the air-fuel ratio of the air-fuel mixture supplied by said air-fuel mixture supply means, throttle sensing means for detecting the operation of said throttle valve and producing an output signal dependent on the magnitude of acceleration and deceleration respectively of said internal combustion engine, and a circuit for varying the constant of said integrating and proportional circuits, the improvement comprising

differentiating circuit means for differentiating the output signal of said throttle sensing means and for producing an output signal dependent on said acceleration and deceleration, respectively,

rectifier means for rectifying said output signal of said differentiating circuit means, and

semiconductor element means, having a resistance which varies with a variation of voltage applied thereto, for increasing the constants of said integrating and proportional circuits with an increase in the output signal of said rectifier means.

4,399,791

AIR-FUEL MIXTURE CONTROL FOR AUTOMOBILE ENGINE HAVING FUEL INJECTION SYSTEM

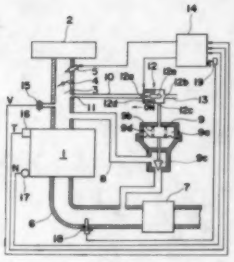
Kazuo Kobayashi; Hideki Tanaka; Katsuyoshi Iida, and Junji Kamite, all of Hiroshima, Japan, assignors to Toyo Kogyo Co., Ltd., Hiroshima, Japan

Filed Aug. 20, 1981, Ser. No. 294,506

Claims priority, application Japan, Sep. 6, 1980, 55-123796

Int. Cl.³ F02M *25/06;* F02B *3/08;* F02D *17/00*

U.S. Cl. 123—489 **3 Claims**



1. An air-fuel ratio control system for an internal combustion engine of a type having a fuel injection system, said control system comprising, in combination:

a fuel intake passage having an injection nozzle for injecting a mist of fuel thereinto for the preparation of a combustible mixture in admixture with incoming air flowing therethrough and a throttle valve;

an exhaust passage means for the discharge of exhaust gases from the engine towards the atmosphere;

an EGR passage means for providing communication between the intake passage means and the exhaust passage means for recirculating a portion of the exhaust gases from the exhaust passage means into the intake passage means;

an EGR control valve means disposed in said EGR passage means for controlling the rate of flow of that portion of the exhaust gases;

a composition sensor disposed in the exhaust passage means for detecting the concentration of a component of the exhaust gases which is a function of the air-fuel mixing ratio of the combustible mixture burned in the engine;

a fuel adjusting means for controlling the amount of fuel to be injected into the intake passage means in dependence on the rate of flow the incoming air through the intake passage means, said rate of flow of the incoming air being detected by a combination of at least two of parameters including the engine speed, the negative pressure developed inside the intake passage means at a position downstream of the throttle valve with respect to the direction of flow of the combustible mixture towards the engine and the opening of the throttle valve, said fuel adjusting means being so adjusted that the air-fuel mixing ratio of the

combustible mixture to be supplied to the engine when the engine operates within a particular operating region is lower than that to be supplied to the engine when the latter operates within the other operating region than said particular operating region;

a first EGR control means for controlling the EGR control valve means according to a control value stored in a memory means when the engine operates within the particular operating region; and

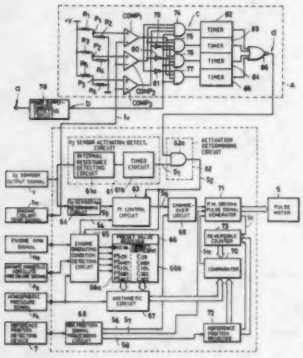
a second EGR control means operable when the engine operates within said other operating region for controlling the EGR control valve means in dependence on the concentration of the exhaust gas component detected by the composition sensor.

4,399,792

AIR/FUEL RATIO CONTROL SYSTEM FOR INTERNAL COMBUSTION ENGINES, HAVING ENGINE WARMING-UP DETECTING MEANS

Kazuo Otsuka, Higashikurume; Shin Narasaka, Yono, and Shumpei Hasegawa, Nilza, all of Japan, assignors to Honda Motor Co., Ltd., Tokyo, Japan

Filed Oct. 5, 1981, Ser. No. 308,501
Claims priority, application Japan, Oct. 7, 1980, 55-140895
Int. Cl.³ F02M *7/00*
U.S. Cl. 123—489 **4 Claims**



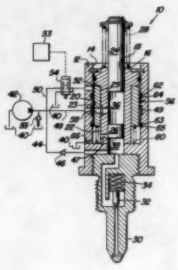
1. In an air/fuel ratio control system for use with an internal combustion engine having an exhaust system, including an O_2 sensor provided in the exhaust system of the engine for detecting the concentration of oxygen present in exhaust gases emitted from the engine; an air/fuel ratio control valve having a valve body position thereof disposed to determine the air/fuel ratio of an air/fuel mixture being supplied to the engine; an actuator arranged to drive the air/fuel ratio control valve in response to an output signal generated by the O_2 sensor; and a temperature sensor arranged to detect the temperature of engine coolant; the combination comprising: a first timer circuit adapted to determine a first predetermined period of time as a function of the temperature of engine coolant available at the start of the engine and start counting the first predetermined period of time thus determined upon the start of the engine; a circuit arranged to detect the internal resistance of the O_2 sensor and adapted to generate a signal when the internal resistance of the O_2 sensor lowers below a predetermined value; a second timer circuit responsive to the signal generated by the internal resistance detecting circuit to start counting a second predetermined period of time; and means for causing initiation of air/fuel ratio control operation based upon the output signal of the O_2 sensor, after the first and second timer circuits both have finished counting the first and second predetermined periods of time, respectively.

4,399,793

FUEL INJECTOR

Bernard B. Poore, East Moline, Ill., and Charles W. May, Cedar Falls, Iowa, assignors to Deere & Company, Moline, Ill.

Filed Mar. 25, 1982, Ser. No. 361,681
Int. Cl.³ F02M *47/02*
U.S. Cl. 123—502 **9 Claims**



1. A fuel injector operable relative to a combustion chamber of an internal combustion engine, said injector comprising:

(a) a housing containing a cylindrical barrel therein and having an annular cavity formed between an inner surface of said housing and an outer surface of said barrel, said barrel having a bore formed therein;

(b) a plunger and a piston spaced therefrom, said plunger and piston being positioned within said bore for axial movement;

(c) a nozzle situated at an end of said bore remote from said plunger for releasing fuel into said combustion chamber;

(d) a timing chamber defined in said bore between said plunger and said piston adapted to receive fluid to create a hydraulic coupling between said plunger and said piston;

(e) a metering chamber defined in said bore between said piston and said nozzle;

(f) passages in said housing and said barrel for receiving pressurized fuel and transmitting said fuel into said timing chamber, into said metering chamber and into an end of said annular cavity;

(g) control means for varying the flow of pressurized fuel through one of said passages and into said end of said annular cavity; and

(h) cylindrical sleeve valve means for controlling both the timing of discharge of fuel from said metering chamber through said nozzle and for controlling the quantity of fuel stored in said metering chamber subsequent to said discharge of fuel, said valve means biasly arranged in said annular cavity and movable in response to pressure variations in said end of said annular cavity.

4,399,794

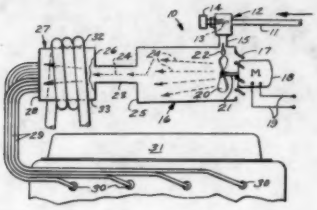
CARBURETION SYSTEM

David C. Gagnon, 227 Whipple St., Fall River, Mass. 02721

Filed Oct. 29, 1981, Ser. No. 316,340
Int. Cl.³ F02M *31/00*
U.S. Cl. 123—523 **2 Claims**

1. A carburetion system for internal combustion engines, comprising, in combination, a mixing chamber for mixing fuel and air, a regulator secured to said mixing chamber for metering a quantity of fuel into said mixing chamber, a heat expansion cylinder secured to said mixing chamber for completely vaporizing the fuel and air mixture, and a fan and motor secured in said system, for pulling air into said system to be mixed with said fuel; said mixing chamber being spaced apart from said heat expansion cylinder by a pipe, said pipe being fixedly secured, at one end, to an end wall of said mixing chamber, the opposite end being fixedly secured, in a similar

manner, to an end wall of said heat expansion cylinder, which is encompassed within a coil of tubing connected to the exhaust manifold of said internal combustion engine; and the opposite end wall of said heat expansion cylinder including fitting means, which secure a plurality of tubes for the passage of the fuel and air vapor produced in said heat expansion cylinder,



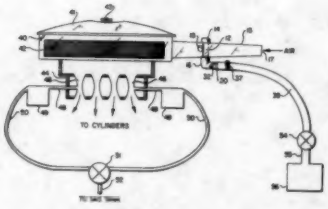
and each of said tubes is suitably and removably secured to an intake fitting received in each of the cylinders of said internal combustion engine, and the opposite end wall of said mixing chamber includes a vent fixedly secured thereto by suitable fastening means, said vent having said motor removably secured to its exterior, which is wired into the ignition circuit of said internal combustion engine.

4,399,795

APPARATUS FOR MIXING GASEOUS FUEL WITH AIR

M. Wayne Brown, Orem, Utah, assignor to IPT Corporation, Provo, Utah

Filed Jul. 17, 1981, Ser. No. 284,042
Int. Cl.³ F02B 43/00; F02M 21/04
U.S. Cl. 123—527 **11 Claims**



1. A system for mixing gaseous fuel with air for subsequent combustion in an internal combustion engine comprising:

a gaseous fuel source;

means associated with said gaseous fuel source to supply gaseous fuel from said gaseous fuel source at atmospheric pressure;

an air intake system having an air inlet and an air intake conduit, said air intake conduit being in fluid communication with said air inlet at one end and with an air filter at the other end thereof; and

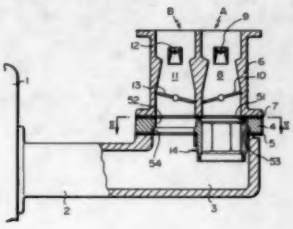
means for admitting gaseous fuel at atmospheric pressure into said air intake conduit for mixture with the incoming air as it passes through said air intake system and said air filter, said means comprising a fluid channel attached at one end thereof to said gaseous fuel source, and at least a portion of the other end of said channel being positioned within said air intake system upstream from said air filter, and said portion comprising fluid outlet means oriented within said air intake system such that a partial vacuum will be created in the vicinity of said fluid outlet means as incoming air flows past said fluid outlet means thereby to draw gaseous fuel into the air flowing past said fluid outlet means.

4,399,796

INTAKE HEATING DEVICE OF AN INTERNAL COMBUSTION ENGINE

Keigo Kato, Toyota; Masahisa Ando, Aichi, and Yosio Kuroiwa, Toyota, all of Japan, assignors to Toyota Jidosha Kabushiki Kaisha, Toyota, Japan

Filed Dec. 1, 1981, Ser. No. 326,265
Claims priority, application Japan, Dec. 2, 1980, 55-169050
Int. Cl.³ F02M 31/00
U.S. Cl. 123—549 **10 Claims**



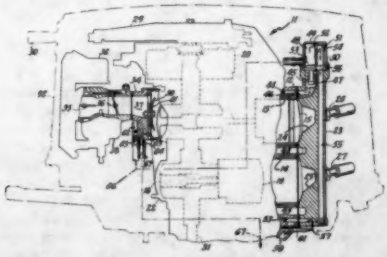
1. An intake heating device of an internal combustion engine, which has a hollow heater vessel placed in an intake passage between the fuel supply means and a cylinder of the engine, said hollow heater vessel comprising: an inner pipe having therein a mixture passage which is aligned with the intake passage; an outer pipe radially spaced from and surrounding said inner pipe, said outer pipe having an inlet end portion and an outlet end portion, said inner pipe having an inlet end portion and an outlet end portion which are bent outwards and are pressed onto outer walls of the inlet end portion and the outlet end portion of said outer pipe for fixing the inlet end portion and the outlet end portion of said inner pipe to the inlet end portion and the outlet end portion of said outer pipe, respectively; a plurality of PTC elements each being inserted between said inner pipe and said outer pipe and having an outer wall and having an inner wall which is in contact with the outer wall of said inner pipe; and power supply means for applying voltage between the inner walls and the outer walls of said PTC elements.

4,399,797

INTAKE HEATING SYSTEM FOR OUTBOARD ENGINE

Tomio Iwai, Hamamatsu, Japan, assignor to Yamaha Hatsudoki Kabushiki Kaisha and Shanshin Kogyo Kabushiki Kaisha, both of Iwata, Japan

Filed May 26, 1981, Ser. No. 266,994
Claims priority, application Japan, May 30, 1980, 55-72958
Int. Cl.³ F02M 31/00
U.S. Cl. 123—552 **15 Claims**



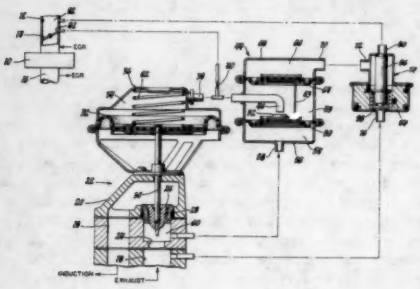
1. A heating system for the induction system of an internal combustion engine comprising an induction system heating

jacket in heat exchange relationship to a portion of said induction system, a coolant pump driven by said engine for pressurizing and circulating from a coolant source, a coolant jacket in heat exchanging relationship with a portion of the engine, conduit means for delivering the coolant pressurized by said coolant pump to said coolant jacket, a first return for returning coolant from said coolant jacket to the coolant source, said first return being substantially unrestricted under all running conditions, and means including a second return for delivering the heated coolant from said coolant jacket to said heating jacket, said second return including means for restricting the flow through said heating jacket to a rate independent of the pressure exerted on the coolant by said pump.

4,399,798
EXHAUST GAS RECIRCULATION CONTROL

Donald D. Stoltman, Henrietta, N.Y., assignor to General Motors Corporation, Detroit, Mich.

Filed Jan. 13, 1982, Ser. No. 339,119
Int. Cl.³ F02M *25/06*
U.S. Cl. 123—571 **10 Claims**



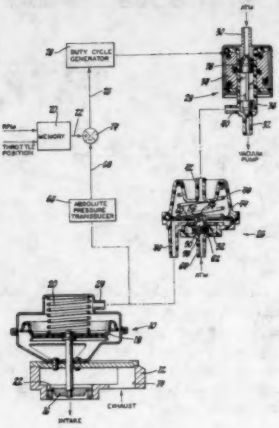
1. An exhaust gas recirculation control assembly for an engine having an induction passage for induction air flow and a recirculation passage for exhaust gas recirculation to said induction passage, said assembly comprising an orifice dividing said recirculation passage into a control pressure zone and a backpressure zone upstream of said control pressure zone, means for creating a reference pressure directly proportional to the backpressure in said backpressure zone, a control valve in said recirculation passage, and means for operating said control valve to provide exhaust gas recirculation at rates which maintain the pressure in said control pressure zone proportional to said reference pressure, whereby exhaust gas recirculation is provided as a proportion of induction air flow with said proportion being independent of induction air flow.

4,399,799
ENGINE CONTROL SUITABLE FOR EXHAUST GAS RECIRCULATION CONTROL

Edward R. Romblom, DeWitt, and Arthur R. Sundeen, Lansing, both of Mich., assignors to General Motors Corporation, Detroit, Mich.

Filed Jan. 26, 1982, Ser. No. 342,729
Int. Cl.³ F02M *25/06*
U.S. Cl. 123—571 **4 Claims**

3. A system for positioning a valve controlling exhaust gas recirculation in an engine and effective to automatically adjust the position of said valve to vary exhaust gas recirculation in accordance with changes in the absolute value of the ambient atmospheric pressure without measuring the absolute value of the ambient atmospheric pressure, said system comprising a closed loop pressure regulator including a unit for generating a control pressure, a transducer for measuring the value of the control pressure generated by said unit, and means responsive both to sensed engine operating conditions and to the measured value of the control pressure for causing said unit to establish a control pressure having the value desired for the sensed engine operating conditions, and a diaphragm subjected on one side to the control pressure and on the opposite side to the ambient atmospheric pressure and connected to said valve for positioning said valve in accordance with the difference between the control pressure and the ambient atmospheric pressure, whereby said valve is positioned to permit exhaust

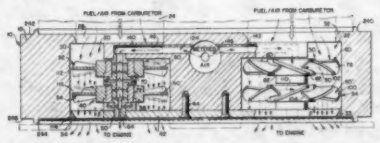


gas recirculation as desired for the sensed engine operating conditions, and wherein said transducer measures the absolute value of the control pressure and said means causes said unit to establish a control pressure having the absolute value desired for the sensed engine operating conditions, whereby the position of said valve is automatically adjusted to vary exhaust gas recirculation in accordance with changes in the absolute value of the ambient atmospheric pressure.

4,399,800
DEVICE FOR IMPROVING FUEL EFFICIENCY IN INTERNAL COMBUSTION ENGINE

Frederick G. Weindelmayer, Pleasant Valley, N.Y., assignor to Free Spirit Enterprises, Inc., Poughkeepsie, N.Y.

Filed May 7, 1982, Ser. No. 376,121
Int. Cl.³ F02M *29/02*
U.S. Cl. 123—592 **15 Claims**



1. A device for improving the fuel efficiency of an internal combustion engine comprising:

a housing having a first bore defined therein located to be fluidly connected to an exit section of an internal combustion engine fuel intake means, a second bore defined in said housing and fluidly connected to said first bore;

mounting means on said housing, said mounting means having a fluid passage defined therein;

an air bearing on said mounting means;

an air supply system fluidly connected to said air bearing;

a first impeller mounted on said air bearing in said second bore, said first impeller having a multiplicity of blades oriented to be impacted by an air-fuel mixture flowing from the fuel intake means, said blades being pitched to drive said first impeller rotationally about said mounting means in a first direction as a result of force created by said impact between said first impeller blades and said fuel-air mixture;

a second impeller mounted on said air bearing in said sec-

ond bore, said second impeller having a multiplicity of blades oriented to be impacted by an air-fuel mixture flowing from said first impeller, said blades being pitched to drive said second impeller rotationally about said mounting means in a direction opposite to that of said first direction as a result of force created by said impact between said second impeller blades and said mixture; and

air ingestion means on said mounting means for ingesting air from said air supply system into the air-fuel mixture.

4,399,801

OVERRUN PREVENTION IGNITION SYSTEM WITH IGNITION ANGLE RETARDATION CIRCUIT

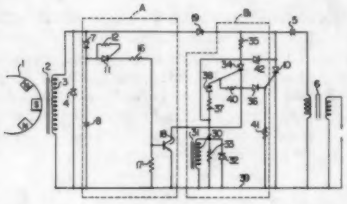
Tadasige Kondo; Susumu Ono, both of Tokyo, and Kenichi Takata, Musashino, all of Japan, assignors to Kioritz Corporation, Japan

Filed Oct. 13, 1981, Ser. No. 310,706

Claims priority, application Japan, Oct. 17, 1980, 55/147126[U]

Int. Cl.³ F02P *1/08, 3/06;* F02D *5/04*

U.S. Cl. 123—603 **3 Claims**



1. An overrun prevention ignition system in which a main capacitor is charged by one component of an electromotive force of a magneto and the charge stored in said main capacitor is discharged through a primary winding of an ignition coil by triggering a main thyristor to induce a high voltage necessary to ignite an engine in a secondary winding of said ignition coil, said overrun prevention ignition system comprising;

(a) a signal generating coil for generating an ignition signal to trigger said main thyristor, in synchronism with the rotation of said engine, said signal generating coil sharing a magneto rotor with said magneto,

(b) a switching circuit connected to a gate circuit of said main thyristor and having a switching transistor for preventing said ignition signal from being applied to the gate of said main thyristor during a conduction period of said switching transistor,

(c) a switching transistor control circuit connected in parallel with a series circuit of said main capacitor and said primary winding of said ignition coil to form a discharging circuit for an auxiliary capacitor to be charged in parallel with said main capacitor by said one component of the electromotive force generated in a generator coil of said magneto, said discharging circuit including a first thyristor and a resistor connected in series therewith, one end of said resistor being connected to a base terminal of said switching transistor, said switching transistor control circuit producing a switching signal to render said switching transistor conductive for a predetermined discharging period of said auxiliary capacitor, and

(d) a circuit for producing a supplementary ignition signal continuing for a predetermined time period following to said ignition signal from said signal generating coil in response to said ignition signal, an output terminal of said supplementary ignition signal producing circuit being connected to a collector-emitter circuit of said switching transistor and to a gate-cathode circuit of said main thyristor, said supplementary ignition signal being bypassed through said switching transistor during the conduction period of said switching transistor and supplied to the gate-cathode circuit of said main thyristor after the termination of said conduction period.

4,399,802

IGNITION ENERGY CONTROL METHOD AND SYSTEM

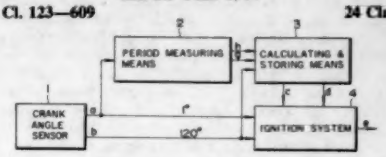
Katsunori Oshiage, Yokosuka, and Akio Hosaka, Yokohama, both of Japan, assignors to Nissan Motor Company, Limited, Yokohama, Japan

Filed Apr. 10, 1981, Ser. No. 252,790

Claims priority, application Japan, Apr. 11, 1980, 55-47578

Int. Cl.³ F02P *3/04*

U.S. Cl. 123—609 **24 Claims**



1. A method of controlling ignition energy supplied to an engine, which comprises the following steps of:

(a) detecting the current engine load and the current engine speed every predetermined time period;

(b) determing the current ignition timing in accordance with the detected current engine load and engine speed;

(c) calculating the current basic ignition energy to be applied to the engine in accordance with the current detected engine speed;

(d) storing the determined current ignition timing and the calculated current basic ignition energy in a memory unit periodically updating same;

(e) detecting the current instantaneous change in engine speed;

(f) comparing the detected instantaneous change in engine speed with a reference value;

(g) correcting the calculated basic ignition energy so as to be increased when the detected instantaneous change in engine speed exceeds the reference value and decreased when the detected instantaneous change in engine speed is lower than the reference value,

whereby ignition energy can be controlled in accordance with the instantaneous change in engine speed.

15. A system for controlling ignition energy supplied to an engine, which comprises:

(a) a crankshaft angle sensor for generating a first pulse signal a whenever a crankshaft for the engine rotates through a first predetermined angle and a second pulse signal b whenever the crankshaft rotates through a second predetermined angle larger than the first predetermined angle;

(b) a period measuring means connected to said angle sensor and provided with a clock signal generator for outputting a count signal h indicative of the number of clock signals f and for generating an interrupt request signal g for each first predetermined crankshaft angle;

(c) a calculating and storing means connected to said angle sensor and said period measuring means and provided with a microcomputer for reading the count signal h, calculating the current period t of the first pulse signal a in dependence upon the read count signal h, calculating the current instantaneous engine speed V on the basis of the calculated period t, calculating the difference between the calculated current engine speed and the calculated preceding engine speed, substituting the current engine speed for the preceding engine speed when the difference is positive and not substituting the current engine speed for the preceding engine speed when the difference is negative thereby obtaining a current maximum engine speed, storing the current maximum engine speed, calculating the difference between the current maximum engine speed

and the preceding maximum engine speed whenever the crankshaft rotates through the second predetermined angle to obtain the instantaneous change in engine speed on the basis of the difference between the two maximum engine speeds, comparing the calculated instantaneous change in engine speed with a reference value, detecting the current engine load, determining the current ignition timing in accordance with the detected engine load and calculated engine speed, calculating the current basic ignition energy to be supplied to the engine in accordance with the detected engine speed, correcting the calculated basic ignition energy so as to be increased when the calculated instantaneous change in engine speed exceeds the reference value and decreased when the detected instantaneous change in engine speed is lower than the reference value, and outputting the determined ignition timing signal d and the corrected ignition energy signal c; and

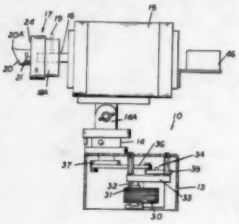
(d) an ignition system connected to said crankshaft angle sensor and said calculating and storing means for outputting an ignition signal e to ignition plugs of the engine in response to the pulse signals a and b, the ignition timing signal d and the ignition energy signal c.

4,399,803

TARGET LAUNCHER

Milo Bertini, 679 Garden St., Trumbull, Conn. 06611

Filed Aug. 5, 1981, Ser. No. 290,209
Int. Cl.³ F41B *15/00*
U.S. Cl. 124—1 **10 Claims**



1. A launcher for launching a target comprising:
a base means defining a support,
a motor mount on said base means,
a reversible motor mounted on said motor mount,
said reversible motor having a motor shaft,
a launcher head connected to the end of said motor shaft, and
holding means on said launcher head for releasably securing a target thereto whereby a target is retained on said launcher head when said motor shaft is being rotated in one direction and whereby a target is released when said motor is reversed.

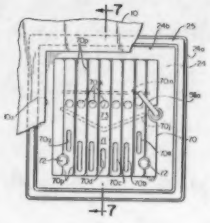
4,399,804

STOVE CONSTRUCTION

James A. Morande, Jr., 480 Griswold St., Glastonbury, Conn. 06033

Division of Ser. No. 886,283, Mar. 13, 1978, Pat. No. 4,213,443, which is a continuation-in-part of Ser. No. 798,263, May 18, 1977, abandoned. This application Jun. 26, 1980, Ser. No. 163,393
Int. Cl.³ F24C *1/14*
U.S. Cl. 126—77 **3 Claims**

1. In a generally rectangular air-tight stove of the type having an access door in one wall, a generally horizontally extending floor defining the generally rectangular firebox, the improvement comprising air inlet valve means provided in said door and including at least one threaded member threadably received in a lower region of the door and adapted to meter inlet air through associated openings, a baffle plate mounted to the inside of the door and having a lower region defining a series of primary air outlets arranged laterally across the width of the door mounted baffle plate, said baffle plate having an integrally defined peripheral flange adjacent the sides and bottom of the door but spaced from the top of said door to define a top opening therebetween, a chevron shaped baffle wall above said primary air outlets, said baffle wall and peripheral flange abutting said door to define a primary air chamber between the door and said baffle plate, and openings defined at opposite ends of said baffle wall to provide air flow into a secondary air chamber defined between the door and said plate



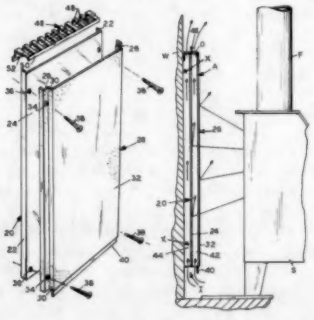
above the chevron shaped baffle wall, a horizonal baffle wall above said chevron shaped baffle wall and defining the upper boundary of said secondary air chamber and secondary air outlets in the baffle plate to provide secondary air to the interior of the stove structure through said secondary air outlets above said primary air outlets said horizontal baffle wall having its ends spaced from said peripheral flange to provide air passages communicating with said top opening.

4,399,805

PANEL INSULATION APPARATUS

Loren C. Kienlen, 225 Banton Ave., and Thomas L. McDonell, 2795 Chuckanut St., both of Eugene, Oreg. 97404

Filed Jun. 29, 1981, Ser. No. 278,848
Int. Cl.³ F24B *7/00*
U.S. Cl. 126—121 **3 Claims**



1. In combination with a wall, a panel for insulating such wall from a stove or like heat source,
said panel comprising an inner elongate panel member of U-shaped cross-section and having a wall portion spaced from and parallel to said wall and opposite vertically extending first side legs extending from said wall portion to said wall thereby to define with said wall a vertically extending channel,
an outer elongate panel member of generally U-shaped cross-section having a front wall portion spaced from and extending parallel to said inner panel member wall portion,
said front wall portion being of narrower width than said inner panel member wall portion,
said outer panel member having opposite second side legs,

each having a first portion extending perpendicularly to and between said inner and outer panel member wall portions, a second portion extending outwardly from said first portion and parallel to said inner panel member wall portion in engagement therewith, and a third portion extending parallel to said first portion toward said wall in engagement with the outer surface of said first legs,

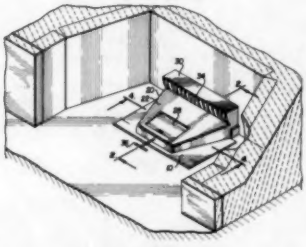
and a plurality of fasteners extending through said second leg portions and said inner panel member wall portion and into said wall thereby to secure said panel members to said wall and to provide a pair of parallel channels for the conduction of air therethrough.

4,399,806

FIREPLACE DRAFT CONTROL

Samuel D. Love, 13510 Old Indian Head Rd., Brandywine, Md. 20613

Filed Apr. 22, 1981, Ser. No. 256,319
Int. Cl.³ F24B *13/02*
U.S. Cl. 126—143 **8 Claims**



1. A fireplace draft control comprising:

a base for resting on a fireplace floor, having a first punchout section for cooperating with an air source in the fireplace floor, and a first movable plate for covering and uncovering said first punchout section;

a hood attached to said base, said hood having a front section, a rear section of greater height than that of said front section, said rear section having an air outlet opening directed substantially over said front section, and a second movable plate located at the lower rear portion of said hood, said hood provided with means for isolating said air outlet opening from said front section while allowing air to flow to said air outlet opening; and

a control member capable of being connected to either said first or second plate, extending outwardly from the front section of said hood.

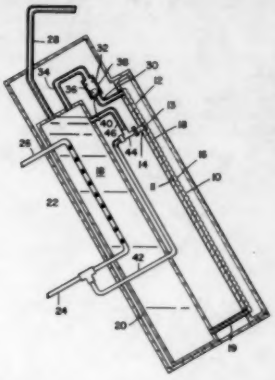
4,399,807

METHOD AND APPARATUS FOR OVERTEMPERATURE CONTROL OF SOLAR WATER HEATING SYSTEM

Bruce S. Buckley, Berkeley, and Thomas A. R. Guldman, Kentfield, both of Calif., assignors to Chevron Research Company, San Francisco, Calif.

Filed Jun. 9, 1981, Ser. No. 271,955
Int. Cl.³ F24J *3/02*
U.S. Cl. 126—418 **3 Claims**

1. In a solar water heating system including a solar collector panel, a water storage tank, a normally closed water circulating conduit means interconnecting said panel and said tank and a one-way valve for controlling the flow of water between said solar collector panel and said water storage tank, an overtemperature control system which comprises temperature responsive means mounted on said solar collector panel to sense the temperature thereof, cold water supply means, valve means in said overtemperature control system operable by said temperature responsive means for introducing cold water from said cold water supply means into said overtemperature control system and conduit means for dumping over-heated water from said closed water circulating conduit means when the temperature of water in said solar collector panel exceeds a



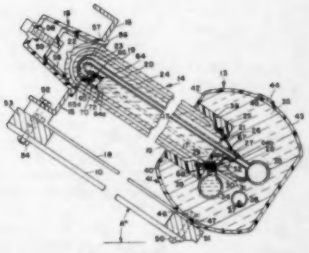
predetermined value; said solar collector panel, said water storage tank, said water circulating conduit means and said overtemperature control system are closely coupled and isolated from any hot water supply system to which heat is to be added.

4,399,808

DRAINABLE SOLAR COLLECTOR UNIT

Joseph R. Frissora, and Michael H. Platt, both of Corning, N.Y., assignors to Owens-Illinois, Inc., Toledo, Ohio

Filed Jul. 31, 1981, Ser. No. 288,968
Int. Cl.³ F24J *3/02*
U.S. Cl. 126—420 **3 Claims**



1. In a solar energy conversion apparatus of the type wherein a heat transport liquid is repeatedly transferred between a solar energy collection area defined by a plurality of solar energy collectors and a thermal energy storage and exchange device, each solar energy collector comprising a double walled tubular element being closed at one end and having a sealed, evacuated space between the walls, means for positioning the double walled tubular element in an inclined position with the remaining open end of the inner tube disposed at the lower end, and means for supplying and removing heat transfer fluid to the bottom open end of the inner walled tube, the improvement comprising: a venting conduit disposed in said inner tube and having an open end disposed in the top portion of said inner tube, and valve means responsive to the height of heat transfer fluid in said inner conduit for closing said open end of said vent tube, thereby freely venting the top portions of the inner tube during filling and removal of heat

transfer fluid and preventing the complete filling of said inner tube with heat transfer fluid.

4,399,809

ARTIFICIAL SPHINCTER FOR USE AT STOMA, OR FOR THE LIKE PURPOSES

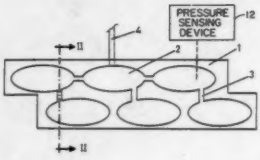
Juan V. Baro, Mtrio de Urdax No. 15, Atico, Pamplona, and Hector O. Hurtado, Paseo Sarasate No. 7, Secto Izqda, Pamplona, both of Spain

Filed Oct. 24, 1980, Ser. No. 200,479

Claims priority, application Spain, Oct. 30, 1979, 485537; May 20, 1980, 491637; May 20, 1980, 491638

Int. Cl.³ A61F 1/00

U.S. Cl. 128—1 R **11 Claims**



1. An artificial sphincter for ensuring continence of stomas of the digestive system, for preventing anal incontinence, for occluding conduits and tubes in the digestive system of the body, and for like purposes, the artificial sphincter comprising:

a flexible band bendable into a cylindrical form adapted to encircle the intestine or other conduit or tube of the body, or the like, which is to be compressed and occluded;

inflatable chamber means defined in said band, said chamber means having a flexible wall and comprising a first plurality of chambers disposed in a first row and a second plurality of chambers disposed in a second row spaced apart from said first row along the axis of said chamber, the chambers of said first row being staggered with respect to said chambers of said second row, each said row extending the length of said band;

a conduit for transmitting fluid to said inflatable chamber means for selectively inflating and deflating said chamber means; and

passages connecting said chambers for establishing uniform pressure among the chambers.

4,399,810

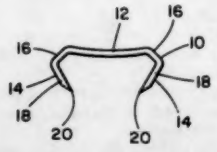
SKIN CLIP AND APPLIER

Peter B. Samuels, 14708 Sutton St., Sherman Oaks, Calif. 91403, Ernest Wood, deceased, late of Los Angeles, Calif. by George S. Lee, executor

Continuation of Ser. No. 98,128, Nov. 28, 1979, abandoned. This application Oct. 26, 1981, Ser. No. 314,533

Int. Cl.³ A61B 17/04

U.S. Cl. 128—337 **4 Claims**



1. A preformed surgical fastener designed to be applied solely by lateral deformation to reduce tissue trauma during and after application to vertically disposed portions of skin tissue which are to be joined in abutting relation comprising:

a deformable wire-like member initially configured to include a slightly concave bail portion and arms initially extending angularly, downwardly and upwardly from the ends of the bail portion and finally downwardly and inwardly in an end portion remote from the bail portion, the ends of the arms being formed to piercing points,

whereby when said fastener is applied solely by lateral deformation of the arms, the bail portion substantially retains its slightly concave shape and the fastener substantially forms a rectangle with the bail and the end portions of the arms forming a first pair of sides of said rectangle and the initial portions of the arms forming a second pair of rectangle sides.

4,399,811

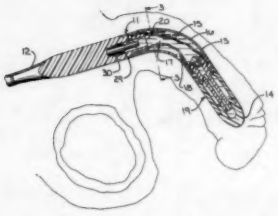
IMPLANTABLE PENILE ERECTILE SYSTEM

Roy P. Finney, Tampa, Fla.; Henry W. Lynch, and Robert E. Trick, both of Racine, Wis., assignors to Medical Engineering Corporation, Racine, Wis.

Filed Aug. 4, 1981, Ser. No. 289,876

Int. Cl.³ A61F 5/00

U.S. Cl. 128—79 **5 Claims**



1. A penile implant comprising an elongated unitary body having a tip portion at one end, an anchoring stem portion at the other end; an intermediate portion having an inner chamber and a radially disposed outer chamber, said inner chamber being non-distensible so that when pressurized and filled with fluid it becomes rigid; a passage providing communication between said inner and outer chambers; pump means within the body for transferring fluid to the inner chamber to pressurize it and make it rigid; and a pressure control valve for controlling the pressure in said inner chamber, said pump means comprising:

(a) a pumping chamber having a resilient wall and being of substantially uniform cross sectional diameter as said intermediate chamber portion;

(b) an inlet to said pumping chamber comprising a passage leading from said outer chamber of the intermediate portion of the implant to said pumping chamber;

(c) a first one way valve normally closing said passage, said valve being openable when fluid pressure in said outer chamber exceeds the fluid pressure in said pumping chamber to permit fluid to flow from said outer chamber into said pumping chamber;

(d) an outlet from said pumping chamber;

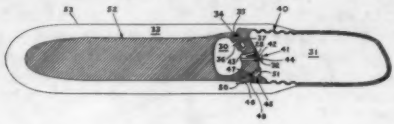
(e) a longitudinal support member positioned in said pumping chamber closing said outlet and in axial alignment therewith, said support member having a fluid flow passage means extending therethrough, said flow passage means communicating at one end with the pumping chamber and at the other end with said inner chamber of the intermediate portion of the implant;

(f) a second one way valve normally closing said flow passage in the support member, said valve being openable when fluid pressure in said pumping chamber exceeds the fluid pressure in said inner chamber so that fluid can be transferred from the pumping chamber into the inner chamber to pressurize said inner chamber and make it rigid.

4,399,812
PENILE PROSTHETIC DEVICE

Edgar D. Whitehead, 785 Park Ave., New York, N.Y. 10021

Filed Dec. 31, 1981, Ser. No. 336,166
Int. Cl.³ A61F 5/00
U.S. Cl. 128—79 3 Claims



1. An inflatable prosthetic device for implantation within a penis; the device comprising in combination:

a fluid storage section;

a pumping mechanism integral with and in fluid communication through at least one conduit formed therebetween with said fluid storage section;

at least one membrane enclosing said pumping mechanism and said fluid storage section to form a distal expansile section that is in selective fluid communication with said pumping mechanism;

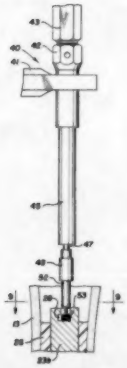
a pressure relief valve for establishing fluid communication between said distal expansile section and said fluid storage section to establish a predetermined maximum fluid pressure within said distal section; and

a distal stiffener integral with said pumping mechanism and protruding distally therefrom within said membrane in order to form said distal expansible section therebetween.

4,399,813
APPARATUS AND METHOD FOR REMOVING A PROSTHESIS EMBEDDED IN SKELETAL BONE

Forest C. Barber, P.O. Box 7744, Fort Worth, Tex. 76111

Filed Jan. 22, 1981, Ser. No. 227,389
Int. Cl.³ A61F 5/04
U.S. Cl. 128—92 EC 22 Claims



1. Apparatus for removing a fragment of a prosthesis from embedment in a bone, comprising

a drill assembly including an elongated tubular support, a drill motor mounted at one end of said tubular support having a drive shaft extending therethrough, and drill chuck means mounted at the end of said shaft projecting from said support;

a drill guide assembly including an elongated tubular drill guide dimensioned to receive said tubular support in sliding relation, one end of said drill guide having a recessed end face configured to overlie and engage an end of the prosthesis, and means for limiting movement of said drill assembly relative to said drill guide end face;

drill bit means for drilling a hole with an undercut ledge in the prosthesis;

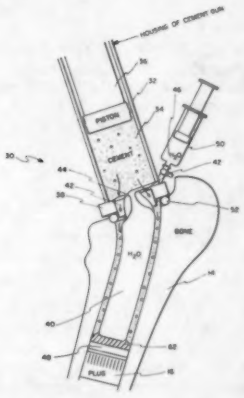
an extractor assembly including an extractor having an externally threaded body and an internally threaded tubular holder for said body; said extractor having an axial shaft to be received in said hole, said shaft having laterally projecting means at its distal end defining a ledge; said extractor having a longitudinal cam slot for guiding a follower wedge, said follower wedge being movable axially by the end face of said tubular holder to effect lateral movement of said shaft within said hole to place said ledges in interference relation;

and said extractor assembly further including means for coupling to said extractor holder for imparting axial impact blows to said extractor.

4,399,814
METHOD AND APPARATUS FOR PRESSURE-COATED BONES

George W. Pratt, Jr., Wayland; Robert Poss, Marblehead, and Timothy T. Lane, Brookline, all of Mass., assignors to Massachusetts Institute of Technology, Cambridge, Mass.

Filed Apr. 27, 1981, Ser. No. 258,073
Int. Cl.³ A61F 5/04
U.S. Cl. 128—92 C 5 Claims



1. A delivery device for coating a portion of, and effecting a degree of penetration into the walls of a bone with a coating material, the device comprising:

(a) means for defining a controlled volume working space adjacent to the bone structure;

(b) means for introducing the coating material into the working space;

(c) pressure means for forcing the material into the structure of the walls, whereby a modified bone is produced, the pressure means comprising an inflatable bladder capable of expansion within the controlled volume to exert pressure on the coating material.

4,399,815
PNEUMATIC THERAPEUTIC HEEL AND ANKLE GUARD

Joan E. Bachorik, R.D. 1, Oneonta, N.Y. 13820

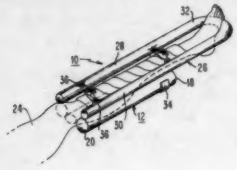
Filed May 13, 1981, Ser. No. 263,304
Int. Cl.³ A61F 5/30
U.S. Cl. 128—153 7 Claims

1. A pneumatic therapeutic heel and ankle guard for bed ridden patients comprising:

(a) an elongated inflatable base member having a top and bottom surface and front and rear ends;

(b) an inflatable elongated "U"-shaped tube comprised of two elongated leg members and a "U"-shaped member connecting one end of each leg;

wherein each leg member is mounted along the length of the top surface of the base member with sufficient space between



the leg members to surround the patients leg so that the leg rests securely on the top surface of base member and between the leg members, and

wherein the "U"-shaped member extends beyond the front of the base member a sufficient distance to provide free air circulation around the ankle while the sole of the patients foot rests upon "U"-shaped member and permits the free range of motion of the foot.

4,399,816

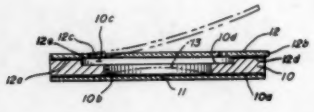
WOUND PROTECTOR WITH TRANSPARENT COVER

George M. Spangler, 15704 Campbell, Harvey, Ill. 60426

Continuation-in-part of Ser. No. 131,153, Mar. 17, 1980, abandoned. This application Jan. 28, 1982, Ser. No. 343,538

Int. Cl.³ A61F *13/00*

U.S. Cl. 128—154 **6 Claims**



1. A wound protector comprising: a planar base pad having a central opening therethrough of an area larger than the wound area to be protected, a recess in the top surface of said base pad forming a ledge around said central opening, said ledge to receive a surgical sponge, said pad being of a non-allergenic material selected from the group consisting of felt-like, nonwoven and closed-cell foamed substances, said pad having a thickness such that a surgical sponge placed in said recess will not contact said wound area, said pad further having a non-allergenic adhesive on its undersurface for adhering said protector to the skin, and a pre-use, releasable foil covering the entire undersurface of said base pad including said central opening to protect said adhesive prior to use of the device; and a flat, transparent cover of the same configuration as said base pad, one side of said cover being secured to the upper surface of said base pad over the length of that side of the base pad and out to the edge of said recess, the opposite side of said cover having an outwardly projecting lip, said cover being semi-rigid and having sufficient flexibility so that when the lip is raised from the base pad, the cover will have a hinge-like action at the area of adhesive securement to the base pad, the undersurface of said cover in said lip area being coated with a second adhesive of a tacky type which will hold the other end of said cover on said base pad and will permit the said other end of said cover to be released from said base portion, said cover further having at least two ventilating openings through said cover, said openings being so positioned on said cover over said ledge.

4,399,817

BORON CONTAINING POLYPHOSPHONATES FOR THE TREATMENT OF CALCIFIC TUMORS

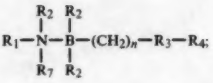
James J. Benedict, Cincinnati, Ohio, assignor to The Procter & Gamble Company, Cincinnati, Ohio

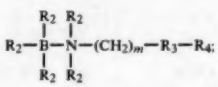
Filed Jun. 30, 1981, Ser. No. 278,969

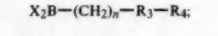
Int. Cl.³ A61K *49/00;* **A61N** *5/06*

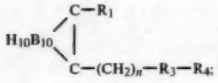
U.S. Cl. 406—20 **34 Claims**

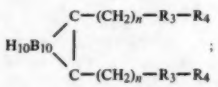
26. A method for the treatment of calcific tumors comprising systemically administering to an animal afflicted therewith a safe but effective dose of a compound selected from the group of boron containing polyphosphonates of the formula:

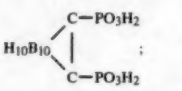


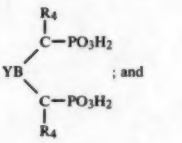


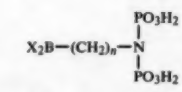




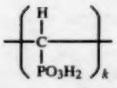








wherein X is benzyl, phenyl, naphthyl, lower alkyl, halogen alkoxy, diol, or hydroxyl; Y is benzyl, phenyl halogen, hydroxyl naphthyl or amine; R_1 is hydrogen or an alkyl group containing from 1 to 24 carbon atoms; R_2 is hydrogen or an alkyl group containing of from 1 to 10 carbon atoms; n is an integer from 0 to 10; m is an integer from 1 to 10; R_3 is



wherein k is an integer of from 2 to 10, or

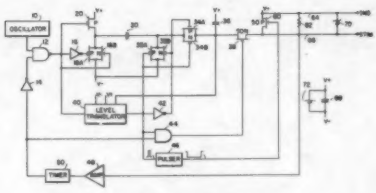
or an ester or a salt thereof; R_4 is halogen, hydrogen, OH, NH_2 or CH_2OH
and the pharmaceutically acceptable salts and esters thereof; and subsequent irradiation of the tumor site with thermal or epithermal neutrons.

4,399,818

DIRECT-COUPLED OUTPUT STAGE FOR RAPID-SIGNAL BIOLOGICAL STIMULATOR

David K. Money, Pennant Hills, Australia, assignor to Telectronics Pty. Ltd., Lane Cove, Australia

Filed Apr. 6, 1981, Ser. No. 251,192
Int. Cl.³ A61N 1/36
U.S. Cl. 128—419 PG **27 Claims**



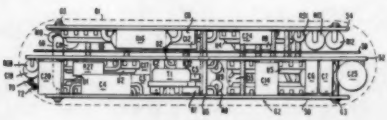
1. A heart pacer comprising a battery supply, a pair of electrodes for applying a stimulating pulse to the heart of a patient, means connected to at least one of said electrodes for sensing heart activity, storage capacitor means, means responsive to said sensing means for determining the need for a stimulating pulse and in response thereto for connecting said storage capacitor means across said electrodes to apply a stimulating pulse to said patient's heart, means for charging said storage capacitor means from said battery supply following the application of a stimulating pulse to said patient's heart, and means operative following the application of a stimulating pulse to said patient's heart for coupling said electrodes directly to each other and independent of said battery supply to allow charge stored in the interfaces between said electrodes and said patient's tissue as a result of said stimulating pulse to be largely recovered, through said electrodes.

4,399,819

HEART PACER MECHANICAL CONSTRUCTION

David Cowdery, East Ballina, Australia, assignor to Telectronics Pty. Ltd., Lane Cove, Australia

Filed Dec. 21, 1981, Ser. No. 332,922
Int. Cl.³ A61N 1/36
U.S. Cl. 128—419 P **27 Claims**



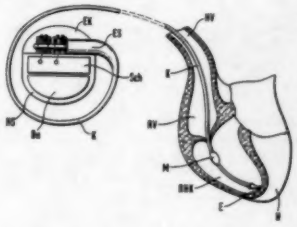
1. A heart pacer comprising a case having an inner surface and an outer surface; a case cover sealed to the top of said case and containing at least one stimulating electrode terminal extending therethrough to the interior of said case; a power cell at the bottom of said case; and an electronic assembly positioned between, and connected to, said power cell and said at least one stimulating electrode terminal; characterized by said electronic assembly having three printed circuit boards arranged in parallel with each other and mechanically fixed relative to each other by cross-wires which electrically connect the circuit boards to each other; each of a vast majority of discrete components and integrated circuit packages in said electronic assembly being contained completely on only one of said boards; two sets of discrete components and integrated circuit packages being contained on two respective adjacent boards, with the two sets facing each other and one set being arranged on its respective board to extend into spaces between the discrete components and integrated circuit packages of the set on the other board such that the two boards are separated by a distance which is approximately equal to the height of the highest discrete component or integrated circuit package of all those contained on the two boards; at least one discrete component having its two ends connected to the two outer boards and passing through a hole in the middle board.

4,399,820

PROCESS AND DEVICE FOR REGULATING THE STIMULATION FREQUENCY OF HEART PACEMAKERS

Alexander Wirtzfeld, No. 26 b, Haupstrasse, 8191 Thanning; Roland Heinze, No. 13, Wilhelm Diess Weg, 8000 München 81; Thomas Bock, No. 48, Türkenbundweg, 8000 München 21, and Hans D. Liess, No. 106, Fasanenstrasse, 8025 Unterhaching, all of Fed. Rep. of Germany

Filed Feb. 5, 1982, Ser. No. 346,315
Claims priority, application Fed. Rep. of Germany, Feb. 26, 1981, 3107128
Int. Cl.³ A61N 1/36
U.S. Cl. 128—419 PG **18 Claims**



1. A process for regulating the stimulation frequency of heart pacemakers as a function of the measured change of a physiological parameter of the blood circulation, preferably the central venous oxygen saturation, comprising the steps of

(a) forming the quotient from the change of the measured value of the physiological parameter ΔS_{02} within relatively short time ranges $\Delta t_{1(4)}$ divided by the maximum change of the measured value ΔS_{02max} within relatively long time ranges Δt_0 in order to determine the control value $B_{S1(4)}$, thus

$$B_{S1(4)} = \frac{\Delta S_o \cdot \Delta t_o}{\Delta S_{02max} \cdot \Delta t_{1(4)}}$$

(b) regulating the stimulation frequency (f) of the heart pacemaker, with a utilization of the central venous oxygen saturation as physiological parameter depending on the control value $B_{S1(4)}$, in such a manner that always the greatest possible blood oxygen saturation is achieved with the lowest possible stimulation frequency, and

(c) measuring the central venous oxygen saturation by means of an optical measuring probe (M) in such a manner that the light emitted by a light-emitting element (32) and reflected by the blood (44) causes an electrical current flow in a light-receiving element (37) which effects, at a constant voltage (U_K) of the measuring probe, an increase

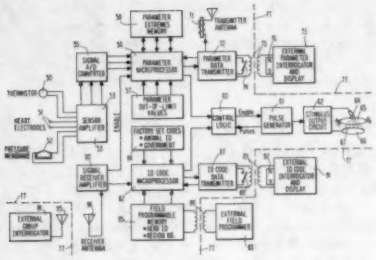
(ΔI_S) of the flow of current (I_S) through the measuring probe, or at a constant flow of current I_K, a damping (ΔU_S) of the probe voltage (U_S).

4,399,821

FREE MOVING ANIMAL PHYSIOLOGICAL MONITORING AND IDENTIFICATION SYSTEM AND METHOD

David L. Bowers, 17399 Plaza Dolores, San Diego, Calif. 92128

Filed Feb. 19, 1981, Ser. No. 236,058
Int. Cl.³ A61B *5/00*
U.S. Cl. 128—630 **26 Claims**



1. A system for monitoring the physiological condition of an animal, comprising:

an implant device positionable in or on said animal, said implant device having

at least one sensor means for sensing a physiological parameter of said animal and producing a parameter output,

logic means responsive to said sensor means for storing a reference value of said parameter, comparing said parameter output with said reference value and producing a logic signal when said parameter output exceeds said reference value;

output means responsive to said logic signal for providing an electrical stimulus signal; and

stimulus means for connecting said stimulus signal to said animal so as to evoke a response by said animal.

4,399,822

ULTRASONIC EQUIPMENT FOR GENERATING SECTION IMAGES

Christoph Theumer, Timelkam, Austria, assignor to Kretztechnik Gesellschaft mbH, Zipf, Austria

Filed Jan. 22, 1981, Ser. No. 227,479
Claims priority, application Austria, Jan. 23, 1980, 341/80
Int. Cl.³ A61B *10/00*
U.S. Cl. 128—660 **4 Claims**

1. In ultrasonic equipment for examinations using section displays, comprising

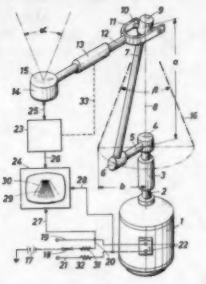
a pivoted carrier,

sound transducer head means carried by, and fixed to, said carrier and operable to transmit an ultrasonic sound beam into a section surface of an object to be examined and to derive echo signals from echoes orignated in said section surface in response to said sound beam,

a scanning mechanism including a rotary reversible motor and a transmission operable by said motor to impart to said carrier an oscillating pivotal motion through an angle of swing whereby said sound beam is caused to scan a sector of said section surface, said transmission consisting of a crank mechanism for transforming a rotational motion of said motor into said oscillating angular motion and comprises an eccentric member adapted to be rotated by said motor about an axis of rotation, a connecting rod pivoted to said eccentric member on a first pivotal axis spaced from said axis of rotation, and a bearing member disposed adjacent to said axis of rotation and pivoted to said carrier on a second pivotal axis which is transverse to said axis of rotation, said connecting rod being rotatably mounted in said bearing member, said carrier being pivoted on a third pivotal axis which intersects said axis of rotation, and said connecting rod being arranged so that, in response to a rotation of said eccentric member about said axis of rotation, said connecting rod describes a surface of an imaginary cone having an included angle that is equal to said angle of swing and imparts to said carrier a pivotal movement about said third pivotal axis through said angle of swing,

a display unit comprising a fluorescent screen,

display control means for causing said display unit to display on said fluorescent screen a section image in which each of said echo signals is displayed at a location which is



geometrically coordinated with the location at which the corresponding echo has originated in said section surface, and

adjusting means for adjusting said angle of swing and the angular width of said section image, said adjusting means being adapted to alter the ratio of the effective length of said connecting rod between said first and second pivotal axes to the distance from said axis of rotation to said first pivotal axis, whereby said angle of swing is altered as well as the transmission ratio of said crank mechanism, said adjusting means being arranged to adjust said ratio to a first value in response to an initiation of a rotation of said motor in a first sense and to adjust said ratio to a second value in response to an initiation of a rotation of said motor in a second sense.

4,399,823

APPARATUS FOR DETECTING PROBE DISLODGEMENT

Michael M. Donnelly, Tipperary, Ireland, assignor to Air-Shields, Inc., Hatboro, Pa.

Filed Oct. 5, 1981, Ser. No. 308,361
Int. Cl.³ A61B *5/00*
U.S. Cl. 128—736 **13 Claims**

6. Apparatus for sensing body temperature comprising:

a probe housing having a contact surface adapted for contact with a body;

a thermistor having an electrical resistance which varies as a function of its temperature, said thermistor positioned within said contact surface of said probe housing for sensing the temperature of said body and for sensing the proximity of said thermistor to said body;

a source of fixed voltage;

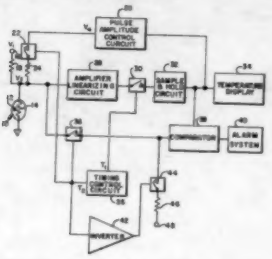
means for coupling said fixed voltage source to said thermistor to develop across said thermistor a first signal component representative of said temperature of said body;

a source of pulse signals;

means for coupling said pulse signal source to said thermistor to periodically heat said thermistor and to develop across said thermistor a second signal component which

varies in accordance with said electrical resistance of said thermistor and is representative of the heating of said thermistor and the heat dissipated from said thermistor, said second signal component changing in level during the period of heating of said thermistor at a rate dependent upon the dissipation of heat from said thermistor during said period of heating;

means coupled to said thermistor for separating said first and said second signal components;



means coupled to said separating means and responsive to said first signal component for developing an indication of said temperature of said body;

and means coupled to said separating means and responsive to said second signal component for developing during said period of heating of said thermistor an indication of said proximity of said thermistor to said body.

4,399,824

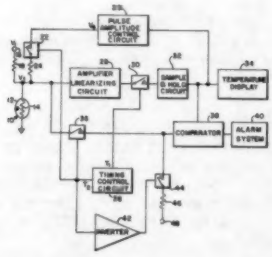
APPARATUS FOR DETECTING PROBE DISLODGEMENT

Ian H. Davidson, Philadelphia, Pa., assignor to Air-Shields, Inc., Hatboro, Pa.

Filed Oct. 5, 1981, Ser. No. 308,362

Int. Cl.³ A61B *5/00*

U.S. Cl. 128—736 **12 Claims**



9. Apparatus for sensing body temperature comprising:

a probe housing having a contact surface adapted for contact with a body;

a thermistor having an electrical resistance which varies as a function of its temperature, said thermistor positioned within said contact surface of said probe housing for sensing the temperature of said body and for sensing the proximity of said thermistor to said body;

a source of fixed voltage;

means for coupling said voltage source to said thermistor to develop across said thermistor a first signal component representative of said temperature of said body;

a source of pulse signals;

means for coupling said pulse signals source to said thermistor to periodically heat said thermistor and to develop across said thermistor a second signal component which varies in accordance with said electrical resistance of said thermistor and is representative of the heating of said thermistor and the heat dissipated from said thermistor;

means coupled to said thermistor for separating said first and said second signal components;

means coupled to said separating means and responsive to said first signal component for developing an indication of said temperature of said body;

and means coupled to said separating means and responsive to said second signal component for developing an indication of said proximity of said thermistor to said body.

4,399,825

COMBINE HARVESTER WITH AN AXIAL-FLOW THRESHING AND SEPARATING UNIT

Giuseppe Raineri, Bassano del Grappa, Italy, assignor to Pietro Laverda S.p.A., Breganze, Italy

Filed Jun. 3, 1981, Ser. No. 270,205

Claims priority, application Italy, Jun. 19, 1980, 53321/80[U]

Int. Cl.³ A01F *12/00*

U.S. Cl. 130—27 S **2 Claims**

1. A combine harvester comprising a cutting table, an axial flow through threshing and separating unit which includes a threshing and separating cylinder, a counter-beater substantially in the form of a concave grill surrounding a lower part of a first portion said threshing separating cylinder, and a separator casing substantially in the form of a tubular grille surrounding a second portion of said threshing and separating cylinder, a support structure fixed to said cutting table and supporting said threshing and separating unit and with the axis of said threshing cylinder being disposed transversely with respect to the longitudinal axis of the compound harvester, a pair of spaced apart plates pivoted about a horizontal transverse axis to the front of said support structure, a shaft having the opposite end thereof carried by said plates with each end of said shaft being slidably disposed in a guide slot in said structure, a transverse feed cylinder mounted on said shaft upstream of said threshing and separating unit to feed a harvested crop through said unit and resilient suspension means for resiliently supporting said plates comprising a support secured to said support structure, a pair of rods articulated to said plates respectfully, and being slidably mounted in said support, an engagement member secured to each rod and resilient means interposed between each engagement member and said support.

4,399,826

VANITY CASE

Hirotake Ogasawara, Funabashi, Japan, assignor to Yoshida Industry Co., Ltd., Tokyo, Japan

Filed Jun. 8, 1982, Ser. No. 386,419

Claims priority, application Japan, Dec. 9, 1981, 56-182138[U]

Int. Cl.³ A45D *33/00*

U.S. Cl. 132—83 R **5 Claims**

1. A synthetic resin-made vanity case comprising:

a receptacle member for containing a cosmetic material therein;

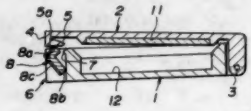
a cover member hinged with said receptacle at the rear end thereof;

a first latching protrusion integrally formed with said corner cover member;

a second latching protrusion integrally formed with said receptacle member for engagement with said first latching protrusion by snap action when said cover member is closed over said receptacle member; and

an unlatch member disposed in either one of said receptacle member and said cover member;

characterized in that said unlatch member is formed to an angular shape including a substantially horizontally extended portion and a substantially vertically extended portion; said unlatch member is housed in a rectangular



recess formed in either one of said receptacle member and said cover member and is pivotably connected at the angular corner thereof to said receptacle or cover member; and that said unlatch member is so arranged that when one of said extended portions is pressed to have said unlatch member pivot about said angular corner, the other of said extended portions acts on a flat surface of the other of said cover member and said receptacle member so as to force said cover member away from said receptacle member, thereby releasing engagement between said first and second latching protrusions and moving said cover member to an open position.

4,399,827

HAIR-TINTING IMPLEMENT

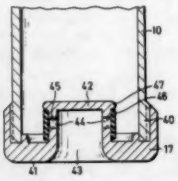
Hans L. Fuhs, Konigstrasse 87, D-5303 Bornheim, Fed. Rep. of Germany

Filed May 15, 1981, Ser. No. 264,168

Claims priority, application Fed. Rep. of Germany, May 17, 1980, 3018984; Apr. 23, 1981, 8112037[U]

Int. Cl.³ A45D *24/26;* A46B *11/00*

U.S. Cl. 132—112 **19 Claims**



1. A hair-tinting implement comprising a tinting-medium container, and a workhead provided with a tinting medium outlet, the container being generally cylindrical and being made of resiliently-deformable material, the workhead being attached to one end of the container and being provided with an internal duct which connects the interior of the container to the outlet, the other end of the container being closed off by a sealing member, an air-intake valve being provided in the sealing member, the air-intake valve being such as to open when the pressure in the container is less than that outside the container, wherein the air-intake valve comprises at least one valve opening passing through the sealing member, a valve seat formed on the interior surface of the sealing member, and a resiliently-deformable valve closure member which overlies the valve seat and said at least one valve opening, wherein the sealing member is provided with an integral socket projection which extends into the container and defines a recess in the sealing member, said at least one valve opening being provided in the socket projection.

4,399,828

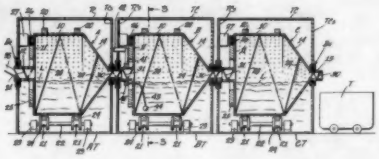
METHODS AND APPARATUS FOR TREATING WORK PIECES

Nicholas G. Kontos, 635 Melwood NE., Warren, Ohio 44483

Filed Oct. 29, 1981, Ser. No. 316,079

Int. Cl.³ B08B *3/06;* B05C *3/08;* C25D *17/20*

U.S. Cl. 134—65 **8 Claims**



1. Apparatus for bulk treatment of work pieces, comprising:

a cylinder mounted for rotation about its longitudinal axis, said axis being generally horizontally disposed,

said cylinder having an axially arranged inlet in one end for receiving work pieces, and an axially arranged outlet in its opposite end through which work pieces are discharged,

a spiral rib on the inner wall surface of said cylinder and of a length to extend substantially between said cylinder ends, said rib acting in the manner of a conveyor screw to push work pieces longitudinally of said cylinder,

means for selectively rotating said cylinder in one direction or in a direction opposite to said one direction,

means at said inlet for engaging work pieces delivered to said inlet and moving them therethrough and into said cylinder when the latter is rotating in said one direction,

the angular hand of said spiral rib being correlated with cylinder rotation whereby said spiral rib is adapted to push the work pieces within said cylinder in a direction toward but not out of said inlet end of said cylinder when the latter is rotating in said one direction to effect good distribution of the work pieces longitudinally along the inner wall of said cylinder,

and said spiral rib being adapted to push said work pieces within said cylinder in a direction toward said outlet end of said cylinder when the latter is rotated in said opposite direction.

4,399,829

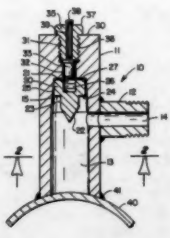
TAPPING APPARATUS AND METHOD

Charles W. Schuler, 3674 Rushmore Dr., Columbus, Ohio 43220

Continuation of Ser. No. 181,000, Aug. 25, 1980, abandoned. This application Apr. 6, 1981, Ser. No. 251,367

Int. Cl.³ F16K *51/00;* F16L *55/10*

U.S. Cl. 137—15 **18 Claims**



12. A method of connecting a conduit to a pipeline containing a fluid comprising:

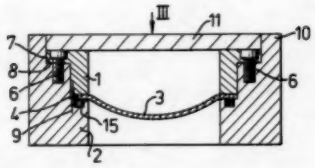
a. connecting an apparatus body having an internal bore to the pipeline;
b. connecting the conduit to the apparatus body and the bore;
c. explosively forcing a punch through the bore in the body into contact with the pipeline, piercing the pipeline; and
d. retracting the punch by tensile force applied in gripping engagement with the punch to overcome the possibility of the punch sticking and to positively withdraw the punch through the bore, to allow the fluid into the bore and into the conduit.

4,399,830

SAFETY PRESSURE RELIEF DEVICE ASSEMBLY

George W. Brodie, Wellington, England, assignor to IMI Marston Limited, Wolverhampton, England

Filed Jun. 29, 1981, Ser. No. 278,613
Claims priority, application United Kingdom, Jul. 21, 1980, 8023777
Int. Cl.³ F16K *13/04*
U.S. Cl. 137—68 R **9 Claims**



1. A safety pressure relief device comprising:
a pressure relief disc having a central domed portion and an annular peripheral region;
first and second annular disc holders adapted to locate and hold the peripheral region of the relief disc, the first of the annular disc holders being located within the second annular disc holder;
an arrester bar located within the second annular disc holder and adapted to be located, in use, downstream of the annular disc;
the relief disc being a reverse buckling disc having its concave side towards the arrester bar and being so held between the annular disc holders as to be completely released from the annular disc holders after reversing under the action of excess pressure on the convex side.

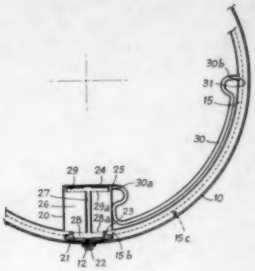
4,399,831

SURFACE TENSION STORAGE TANK

Michel Robert, Montigny Le Bretonneux Trappes, France, assignor to Societe Europeenne De Propulsion, Puteaux, France

Filed Jun. 10, 1981, Ser. No. 272,308
Claims priority, application France, Jun. 20, 1980, 80 13811
Int. Cl.³ B64G *1/00*
U.S. Cl. 137—154 **7 Claims**

1. A surface tension storage tank for liquid, comprising:
an enclosure having a liquid outlet provided in a wall of the enclosure and through which liquid contained therein can be expelled under the action of a pressurant gas;
a liquid collecting device extending in the enclosure;
a tubular device situated inside the enclosure proximate the outlet and provided with a first part having a first cross-section and defining a chamber having a chamber volume communicating with the outlet and the collecting device, and provided with a second part, having a second cross-section smaller than the first cross-section, defining a draining conduit issuing at a first end into an area of the chamber opposite the outlet and which has a second end issuing in the internal volume of the tank and situated at a level of the tank more remote from the outlet than its first end; and



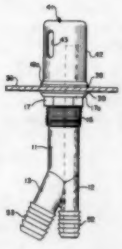
walls forming gas barriers to separate the collecting device from the chamber at their point of communication and to separate the second end of the conduit from the internal volume of the tank.

4,399,832

AIR GAP ASSEMBLY

Robert A. Appleby, Redwood City, Calif., assignor to The Mundo Corporation, Burlingame, Calif.

Filed May 20, 1981, Ser. No. 265,470
Int. Cl.³ F16K *24/00*
U.S. Cl. 137—216 **5 Claims**

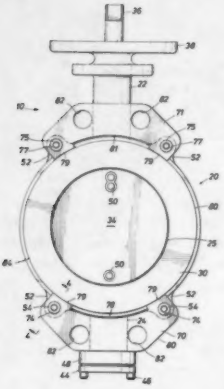


1. In an air gap assembly for preventing backflow from a waste line to an appliance which discharges into the waste line: a vertically extending generally cylindrical hollow body, an inlet tube for connection to the discharge outlet of the appliance extending upwardly within the body and communicating with the interior of the body through the upper portion of said tube, and outlet tube communicating with the interior of the body for connection to the waste line, a pair of diametrically opposed air vents in the body in proximity to the upper portion of the inlet tube, a deflector cap mounted on the body above the inlet tube with a depending skirt interposed between the upper portion of the tube and the air vents, said skirt extending downwardly within the body to a level below the air vents, and a pair of hooks projecting outwardly from opposite sides of the deflector cap in locking engagement with the diametrically opposed air vents for securing the deflector cap to the body.

4,399,833
VALVE ASSEMBLY

Edward G. Holtgraver, Spring, Tex., assignor to Keystone International, Inc., Houston, Tex.

Filed Feb. 4, 1982, Ser. No. 345,660
Int. Cl.³ F16L 55/00
U.S. Cl. 137—315 13 Claims



1. A wafer-type valve assembly for securing to a flange fitting having a flow passageway therethrough and comprising a flange extending radially from said flow passageway, wherein said valve assembly comprises:

a valve body having a flowway therethrough;

connection formations integrally adjoining said valve body and extending generally radially therefrom;

a valve element mounted in said flowway for movement between a first position closing said flowway and a second position opening said flowway;

adapter means adjoining said valve body and extending outwardly therefrom;

first longitudinally extending connector means cooperative between said connection formation means of said valve body and said adapter means to connect said adapter means to said valve body; and

second longitudinally extending connector means cooperative between said adapter means and said flange of said flange fitting to connect said adapter means to said flange fitting.

4,399,834
CHEMICALLY INERT CONTROL VALVE

Hans D. Baumann, 32 Pine St., Rye, N.H. 03870

Filed Oct. 5, 1981, Ser. No. 308,149
Int. Cl.³ F16L 7/00
U.S. Cl. 137—375 8 Claims

1. Chemically inert control valve comprising

(a) housing having a longitudinal central bore extending throughout its lengths;

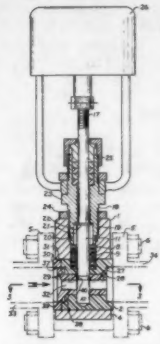
(b) inlet and outlet ends formed on said housing, said inlet and outlet ends adapted to be coupled in a pipe line;

(c) a tubular cylindrical insert having a central port and two terminating ends at least one of which being recessed, removably received in said central bore;

(d) sealing means slidingly arranged inside the central port of said tubular insert and comprising a spool member attached to a flexible web portion connected to an outer flange which abutts one of the terminating and recessed ends of said tubular insert and being arranged to allow fluid differential pressure to deflect said web portion and thereby allow a sliding displacement of said spool member within the central port of said insert;

(e) a central perpendicular cross-bore intersecting said housing, insert and spool member and having an enlarged diameter portion within said housing and insert containing a tubular packing arrangement;

(f) a plug slidably engaged within said packing arrangement



and said perpendicular cross-bore, one lower terminating end of said plug arranged to selectively engage or disengage the spool member portion of said sealing means;

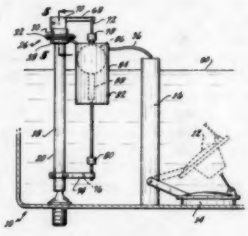
(g) means to position said plug;

(h) means to compress said packing arrangement.

4,399,835
WATER SAVING TOILET CONTROL VALVE

Anton Holderith, 833 W. Redondo Dr., Anaheim, Calif. 92801

Filed Dec. 31, 1981, Ser. No. 336,184
Int. Cl.³ F16K 31/26
U.S. Cl. 137—414 11 Claims



1. An improvement in a toilet holding tank water inlet valve of the type attaching to an upstanding water inlet supply pipe located in said holding tank, said inlet valve having a valve seat located in association with said inlet supply pipe, a flexible valve element formed as a part of a pressure chamber and operatively associated with said valve seat, said pressure chamber including an opening, a valve stem operatively associated with said opening in said pressure chamber and having a closed position wherein said flexible valve element forms a seal against said valve seat and an open position wherein said flexible valve element is spaced away from said valve seat, a pivot arm attaching to said valve in operative association with said valve stem and being located in a first position with respect to said valve when said valve stem is in its closed position and a second position when said valve stem is in its open position which comprises:

retarding means located in operative association with said valve stem and capable of retarding movement of said valve stem;

a vertically oriented member capable of moving reciprocally along an essentially vertical axis, said member having ends

and operatively attaching to said pivot arm adjacent to its upper end, said pivot arm moving between its first and second positions in response to movement of said member along said axis;

means associated with said member for retaining it in said vertical orientation;

a buoyant float means movably associated with said member and capable of reciprocally moving vertically with respect to said member in response to the water level in said holding tank between an upper float position when the water level in said holding tank is at a filled level, at least one intermediate float position and a lower float position when said water level in said holding tank is at a depleted level;

an upper float engagement means operatively associated with said member proximal to the uppermost end of said member;

a lower float engagement means operatively associated with said member proximal to the lowermost end of said member near said depleted water level;

the combined weights of said member, said upper float engagement means and said lower float engagement means incapable of transferring sufficient force through said pivot arm to move said valve stem against said retarding means from its closed position to its open position;

said float means capable of engaging said upper float engagement means as said float means moves from said intermediate position to said upper float position under the buoyant force exerted on it by water as said holding tank fills with water such that said pivot arm is moved from its second position to its first position moving said valve stem against said retarding means to its closed position resulting in said flexible valve element forming a seal with said valve seat;

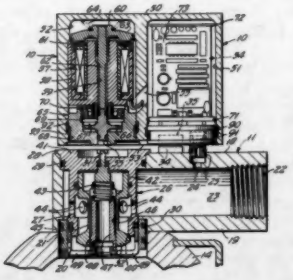
said float means capable of engaging said lower float engagement means as said float means moves from said intermediate position to said lower float position in response to removal of water from said holding tank such that when said water level in said holding tank is at said depleted level the combined weights of said float means, said member and said upper and said lower engagement means move said pivot arm from its first position to its second position moving said valve stem to its open position and disrupting said seal between said flexible valve element and said valve seat.

4,399,836

SELF-CONTAINED CLOSED-LOOP ELECTRICALLY OPERATED VALVE

William I. de Versterre, Warren, and Donald A. Worden, Pompton Plains, both of N.J., assignors to Marotta Scientific Controls, Inc., Boonton, N.J.

Filed Apr. 14, 1981, Ser. No. 254,096
Int. Cl.³ F16K *31/02*
U.S. Cl. 137—487.5 **13 Claims**



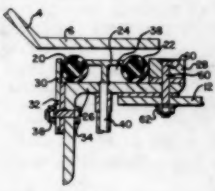
1. In combination, a unitary valve-positioning actuator module comprising a housing having a mounting face, a valve-body module having a mounting face adapted for removable assembly in register to the mounting face of said actuator module, said valve-body module having an internal passage between spaced inlet and outlet ports which are offset from the mounting face of said valve-body module; said valve-body module including (a) a movable valve member for controlling flow in said passage, (b) an actuating stem for said valve member and exposed within the confines of said valve-member mounting face, and (c) means normally biasing said stem to a fully projected extent of such exposure; said actuator module including (a) a guided valve-stem-engageable element exposed within the confines of the mounting face of said actuator module and engaging the exposed end of said stem when said modules are in registered assembly, (b) electromagnetic means including a driver winding for applying displacement force to said valve stem via said valve-stem engageable element in accordance with electrical excitation of said winding, and (c) signal-processing means including a transducer exposed at the mounting face of said actuator module and producing an electrical signal output in accordance with a physical-quantity change detected in fluid to which said transducer is exposed, said signal-processing means further including a command-signal external input connection and comparator means having a first input connected to said command-signal input connection and a second input connected to the electrical-signal output of said transducer; and said body module further having within the confines of its mounting face a transducer port communicating with said passage on the downstream side of said valve member, said port having sealed exclusive communication with said transducer when said modules are in registered assembly.

4,399,837

BAGHOUSE VALVE CONSTRUCTION

George O. Goodboy, Jr., Glendale, Calif., assignor to Joy Manufacturing Company, Pittsburgh, Pa.

Filed Jul. 27, 1981, Ser. No. 287,027
Int. Cl.³ F16K *1/00*
U.S. Cl. 137—614.11 **15 Claims**



1. A baghouse valve construction comprising an annular valve seat member,

a valve element adapted to assume a closed position in intimate engagement with said valve seat member and an open position spaced from said valve seat member,

said valve seat having a pair of annular, radially spaced resilient seal members,

said valve seat member having at least one generally rigid seal member; and

retainer means for securing said resilient seal members in said relative radially spaced position.

4,399,838

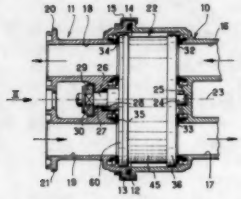
HEATING CONTROL COCK

Yves Poujol, Noisy le Roi, France, assignor to Valeo, Paris, France

Filed Mar. 11, 1981, Ser. No. 242,482
Claims priority, application France, Mar. 31, 1980, 80 07212
Int. Cl.³ F16K *3/32, 11/06*
U.S. Cl. 137—625.29 **15 Claims**

1. A control cock operative to be mounted between the ends

of four pipes, said pipes comprising first fluid supply and return pipes on one side of the cock and second fluid supply and return pipes on the other side, said control cock comprising a cylindrical shell rotatably and sealingly mounted about its axis between the ends of the pipe, said cylindrical shell being rotatable through intermediate conditions between a fully opened position and a fully closed position; said cylindrical shell having disposed therein at least two longitudinal passages which in said fully opened position enable fluid communication between said first and second supply pipes and said first and second return pipes, respectively; said cylindrical shell having a first by-pass channel for enabling fluid communication only between said first fluid supply and return pipes when said cylindrical shell is in said closed position, said first by-pass channel being separated from the ends of the second pipes by a confined space at least partially surrounding the by-pass channel, said space containing a thermal insulating agent; and said cylindrical shell having a second by-pass channel for enabling partial fluid communication between said first fluid supply and return pipes as well as two through-going openings for enabling partial fluid communication between said first and second fluid supply pipes and said first and second fluid return pipes, respectively, while the shell is disposed intermediately between the fully opened and fully closed position.



4,399,839

TUBULAR CASING SUITABLE FOR SMOKED FOODSTUFFS AND PROCESS FOR MANUFACTURE AND USE THEREOF

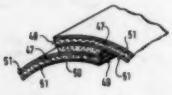
Elfriede Hutschenreuter, Bad Schwalbach, and Andrae Klaus, Zornheim, both of Fed. Rep. of Germany, assignors to Hoechst Aktiengesellschaft, Frankfurt am Main, Fed. Rep. of Germany

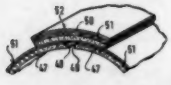
Filed Sep. 21, 1982, Ser. No. 420,949

Claims priority, application Fed. Rep. of Germany, Oct. 3, 1981, 3139481

Int. Cl.³ F16L *11/00*; A22C *13/00*

U.S. Cl. 138—118.1 **8 Claims**





1. A tubular casing suitable for foodstuffs, comprising: a rectangular web of film, which is curved around its longitudinal axis and having its longitudinal edge regions joined by a glued seam to form a tubular casing, the tubular casing being comprised of cellulose or fiber-reinforced cellulose and having at least in the region of the glued seam an adhesive layer which contains a substantially water-insoluble cationic resin for joining the longitudinal edges, and wherein the tubular casing contains, in the region of the glued seam, a smoke-permeable adhesive layer of a room temperature-cured water-insoluble condensation product of a polyamide-polyamine, or an aliphatic polyamine or a polyamide with a bifunctional halohydrin or a halohydrin derivative.

4,399,840

CLOSURE MEMBER

Morris M. Lee, 10 Catherine St., Delmar, N.Y. 12054, assignor to Morris M. Lee; Corina M. Lee, both of Delmar and Walter F. Wessendorf, Jr., Guilderland, all of, N.Y., part interest to each

Filed Apr. 26, 1982, Ser. No. 371,928

Int. Cl.³ F16L *11/12*

U.S. Cl. 138—168 **10 Claims**

1. A closure member insulating, sealing, waterproofing and otherwise protecting an object from the elements; said closure member being of integral, one-piece construction, said closure member being of synthetic resinous heat recoverable material, said closure member having a main-body wall enveloping and wrapping-around said object, said main-body wall having two hooks interconnected and assembled as a mechanical interlocked joint effecting positive mechanical closure and seal of said joint without depending upon fusion for joint integrity, each of said hooks having a metal insert imbedded therein having the configuration of its respective hook, said joint forming with said main-body wall an enveloping tubular member, said hooks having ends, said ends of said hooks having small projections defining detents, said two hooks being a first hook and a second hook, said first hook having a main body, upper leg, knee and lower leg, said upper leg of said first hook having an interior surface, said second hook having a main body and leg, said leg of said second hook having an interior surface; in assembly: said leg of said second hook being mechanically interposed, interfolded and sandwiched between said upper and lower legs of said first hook, said lower leg of said first hook being mechanically interposed, interfolded and sandwiched between said leg of said second hook and said main body of said second hook, said detent of said second hook being mechanically imbedded in said interior surface of said upper leg of said first hook, said detent of said first hook being mechanically imbedded in said interior surface of said leg of said second hook, said upper leg and said lower leg of said first hook defining a corner, said leg and main body of said second hook defining a corner, said corner of said first hook, and said detent of said first hook imbedded in said leg of said second hook, defining and affording a first assembly range or "window" of detent imbedment in said second hook within which range of detent imbedment in said second hook said joint can be misaligned without loss or joint integrity, said corner of said second hook, and said detent of said second hook imbedded in said upper leg of said first hook, defining and affording a second assembly range or "window" of detent imbedment in said first hook within which range of detent imbedment in said first hook said joint can be misaligned without loss of joint integrity; joint integrity being said detent of said first hook remaining sandwiched between said leg and main body of said second hook with said detent of said first hook imbedded in said leg of said second hook, and said detent of said second hook remaining sandwiched between said upper leg and lower leg of said first hook with said detent of said second hook imbedded in

said upper leg of said first hook; and said joint retaining its said joint integrity so long as said detent of said first hook remains sandwiched between said leg and main body of said second hook and said detent of said first hook remains imbedded in said leg of said second hook, and so long as said detent of said second hook remains sandwiched between said upper leg and lower leg of said first hook and said detent of said second hook remains imbedded in said upper leg of said first hook, and such mechanical imbedments of said detents with said respective hooks effecting such positive mechanical closure and seal of said joint.

4,399,841

METHOD AND DEVICE FOR THE MANUFACTURE OF A WOVEN FABRIC AND WOVEN FABRIC MANUFACTURED ACCORDING TO THE METHOD

Jakob Müller, Stansstad, Switzerland, assignor to Textilma AG, Hergiswil, Switzerland

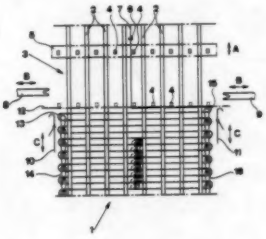
PCT No. PCT/CH81/00018, § 371 Date Sep. 8, 1981, § 102(e) Date Sep. 8, 1981

PCT Filed Feb. 17, 1981, Ser. No. 302,439

Claims priority, application Switzerland, Feb. 21, 1980, 1416/80

Int. Cl.³ D03D *5/00, 47/42*

U.S. Cl. 139—383 R **11 Claims**



1. In a method of weaving a fabric having two similar edges by means of a loom having a loom reed containing tooth gaps in which at least a weft thread is laid into at least a shed formed of warp threads having a warp direction for the formation of a double-loop extending in zig-zag shape, and in which, to form the edges on both sides of the fabric, alternated left and right looped ends of the double-loops extend beyond the respective outermost warp thread where they are bound with themselves or with an auxiliary thread, glued or fixed together, the improvement comprising the steps of:

feeding, according to program, for each weft thread insertion a weft thread through one of the tooth gaps of the loom reed to introduce, in the warp direction and within the warp width, said weft thread between two warp threads into a shed formed by the warp threads;

forming in the shed said double-loop extending in zig-zag shape from said introduced weft thread by means of two weft thread introduction organs arranged laterally of the shed and spaced in the warp direction, one of said weft thread introduction organs pulling or drawing out the weft thread beyond the outermost warp thread on a side of the shed and the other weft thread introduction organ pulling or drawing out the weft thread beyond the outermost warp thread on the opposite side of the shed; and

beating the formed double-loop against a beating edge of the fabric by means of the loom reed.

6. A shuttleless loom comprising:

a loom reed for beating of the fabric and provided with tooth gaps for guiding the warp threads of a warp having a warp direction;

thread guiding means having at least a thread guide arranged behind the loom reed to fed, according to program, at least a weft thread through one of the reed tooth gaps and to introduce, in the warp direction and within the warp width, said weft thread into a shed formed by the warp threads;

two weft thread introduction organs arranged externally of the shed and movable into the shed;

said weft thread introduction organs being spaced in the warp direction to catch said weft thread introduced into the shed and conduct it in zig-zag manner across the warp by pulling or drawing said weft thread out to each side of the shed and beyond the outermost warp thread respectively; and

an edge forming means arranged on the loom at each side of the fabric to catch and hold laterally, the outermost weft thread portions conducted into the shed by said weft thread introduction organs so as to form edges of the fabric.

4,399,842

WIRE-LAYING TOOL

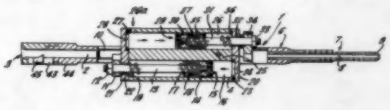
Ralph D. Gibbons, Hampshire, England, assignor to Lansing Bagnall Limited, Hampshire, England

Filed Mar. 16, 1982, Ser. No. 358,666

Claims priority, application United Kingdom, Mar. 25, 1981, 8109427

Int. Cl.³ B21F *3/00*

U.S. Cl. 140—92.1 **10 Claims**



1. A wire-laying tool comprising:

an elongate body having a longitudinal passageway adapted for the passage of wire from a rear end to a front end;

a forward extension of the passageway including a stem and a probe movably mounted with respect to the stem;

first and second actuators arranged respectively to advance wire relative to the passageway and to retract said probe with respect to the stem; and

means for inhibiting rearward movement of the wire relative to the passageway.

4,399,843

ZIG-ZAG WINDING MACHINE

Richard D. Sedgewick, 100 Horne St., Dover, N.H. 03820

Division of Ser. No. 198,928, Oct. 20, 1980, Pat. No. 4,331,896. This application Jan. 25, 1982, Ser. No. 342,647

Int. Cl.³ B21F *3/00*

U.S. Cl. 140—92.2 **7 Claims**

1. Apparatus for winding annular zig-zag windings comprising:

winding arbor means having a surface and mounted for rotation for receiving coil forming wire in an annulus around the rotating arbor means;

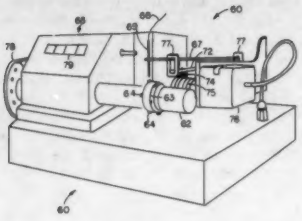
a plurality of pins spaced apart around the arbor means in at least two opposite rings of pins defining the opposite perimeters of the annular winding to be formed, said pins mounted in the winding arbor means to form acute angles with the surface of the arbor means each ring of pins oriented with the acute angles in the direction away from the other ring of the arbor means, said pins being removable and replaceable to facilitate removal of windings from the arbor means;

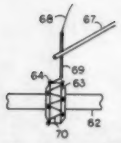
means for rotating the winding arbor means;

wire feed winding arm means mounted for delivering coil winding wire to the surface of the winding arbor means;

and means for reciprocating said winding arm means back and forth laterally across the winding arbor means in a span greater than the spaced apart rings of pins mounted

in the arbor means and in timed relationship to the rotation of the winding arbor means by the rotating means whereby the coil winding wire may be fed onto the surface of the arbor means in a zig-zag pattern of peaks and





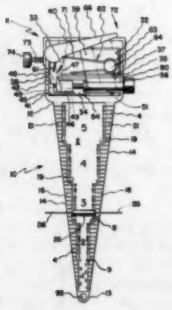
troughs held in the acute angles formed by the spaced apart pins arranged around the winding arbor means, said zig-zag winding supported by pins of alternately opposite rings on the winding arbor means.

4,399,844

COMPONENT LEAD BENDING AND CRIMPING TOOL

Marvin Kober, Spring Valley, and Eugene Battaglia, New York, both of N.Y., assignors to O.K. Machine and Tool Corp., New York, N.Y.

Filed Apr. 23, 1982, Ser. No. 371,255
Int. Cl.³ B21F *1/00*
U.S. Cl. 140—106 **12 Claims**



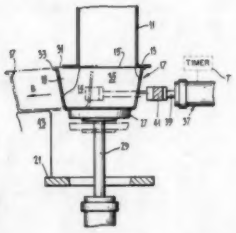
1. A component lead bending and crimping tool for adjustably bending and crimping one or more of its axial leads, comprising a handle portion having a generally triangularly shaped body portion with converging outer raised edges having plural parallel aligned grooves for receiving the component's oppositely-extending axial leads for transverse bending of its leads, said handle portion further comprising a block having recessed front and back surfaces for receiving the component body when its leads are positioned in one set of aligned grooves, the raised edges formed by the recess on the front surface having a stepped outline forming raised lands of varying width, the raised edges formed by the recess on the back surface having a straight outline forming raised lands of uniform width, the depth of the grooves on the front surface of the handle portion being different from the depth of the grooves on the back surface, the recess on the back surface being sufficiently deep to allow the component body axis to be located below the depth of the grooves on the raised lands on said back surface, means on the tool for receiving and vertical bending of one or more of the component's leads, and means on the tool under control of the user for receiving and crimping one or more of its leads at a preselected location along the lead.

4,399,845

DISPENSING METHOD AND APPARATUS

Taki Stanton, Mount Waverley, Australia, assignor to Universal Nominees Pty. Ltd., Richmond, Australia

Continuation of Ser. No. 76,992, Sep. 19, 1979, abandoned. This application May 21, 1981, Ser. No. 266,009
Claims priority, application Australia, Sep. 29, 1978, PO6159
Int. Cl.³ B65B *3/34, 43/58*
U.S. Cl. 141—1 **17 Claims**



1. A method for dispensing plastic material into a container through its top, said container having a peripheral top edge defining a container opening, said plastic material being expelled from an extruder having an extruder opening oriented downwardly and provided with a flange therearound, said method comprising:

extruding plastic material from said extruder at a substantially uniform rate;

raising said container from a position spaced below the extruder into a position in which at least a portion of the peripheral edge of the container is in abutment with the extruder flange;

maintaining the peripheral edge in abutment with the extruder flange and maintaining the extruder opening in a fixed position so as to enable plastic material extruded through said extruder opening to pass into said container through said opening; and

moving said container in a substantially horizontal direction at a spaced interval controlled by a timer to thereby sever plastic material extruded through said extruder opening away therefrom into said container, the spaced interval being a function of the rate of extrusion of the plastic material.

4,399,846

MECHANISM FOR GRANULOMETRIC DISTRIBUTION OF SOLID PARTICLES

Edson De Souza Dias; Luiz D. D. Santos; Joao C. Teixeira; Osvaldo Amorin, and Antonio R. D. A. Lamprecht, all of Sao Mateus do Sul, Brazil, assignors to Petroleo Brasileiro S.A. - Petrobras, Rio de Janeiro, Brazil

Filed Apr. 20, 1981, Ser. No. 255,815
Claims priority, application Brazil, Apr. 18, 1980, 8002400
Int. Cl.³ B65B *1/04*
U.S. Cl. 141—192 **11 Claims**

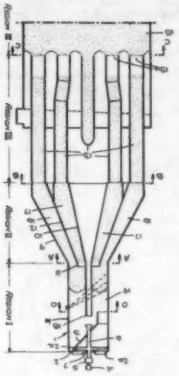
11. Mechanism for granulometric distribution of solid parti-

cles which is specially designed to provide the loading of such solid particles into large dimension vessels starting from equipment of small dimensions in relation to said vessels; the mechanism being characterized in that:

means (3) having an outlet opening (8) operable to be variably positioned relative to said mechanism for corresponding introducing disaggregated solid particles into said mechanism;

means, constituted of a plurality of inclined concentric surfaces (10, 12) positioned under said outlet opening (8) of said introducing means (3), for providing for a free flowing of said disaggregated solid particles along a plurality of generally downwardly directed paths from the region location; and

means comprising a plurality of concentric closed lines of



fixedly positioned downwardly inclined tubes (13) positioned under the region where said inclined surfaces are located, for conducting said disaggreated solid particles away from said lower location, with reach of said lines of tubes communicating with a respective one of the flow paths defined by said inclined surfaces, and said tubes being provided with a symmetric arrangement of their lower extremities (13*a*) in the region where said tubes open to the interior of the associated vessel (15);

said inclined surfaces (10, 12) and said descending tubes (13) being constructed and arranged such that, during the loading operation, said disaggregated solid particles form a continuous bed from the location (19) where they fall from said introducing means (3) to the location where they leave said descending tubes (13) and accumulate in the interior of the associated vessel (15).

4,399,847

APPARATUS FOR DRAINING VISCOUS FLUIDS

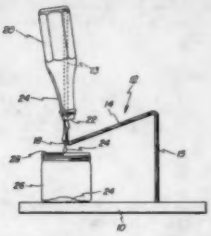
William J. McRoberts, 2475 Brookshire Dr., Schenectady, N.Y. 12309

Continuation of Ser. No. 906,432, May 17, 1978, abandoned. This application Apr. 8, 1982, Ser. No. 366,719

Int. Cl.[3] **B65B** *3/06*

U.S. Cl. 141—364 **8 Claims**

1. An apparatus for draining a viscous fluid from a delivering container to a receiving container comprising a base and a support member for placing the delivering container in the inverted position whereby the sides of the delivering container become inclined and the fluid is permitted to drain from the mouth thereof onto the support member, said member having a lower section for mounting to said base, an intermediate section for directing the draining of the fluid and an upper section for inserting into the delivering container and for supporting the delivering container in the inverted position, said upper section being long enough for the bottom of the inverted container to rest thereon and to maintain said container above said intermediate section, wherein a drip-directing point for permitting dripping of said fluid by means of gravity



is formed between said intermediate section and said upper section, said intermediate section being in a horizontal plane or rising from said point.

4,399,848

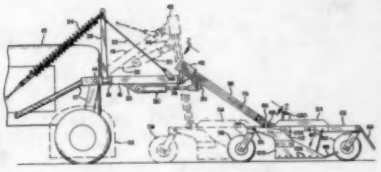
TREE CUTTING MECHANISM

Wayne A. Fetters, P.O. Box 841, Canby, Oreg. 97013

Filed Nov. 9, 1981, Ser. No. 319,804

Int. Cl.[3] **A01G** *23/08*

U.S. Cl. 144—34 E **12 Claims**



1. A tree cutting mechanism comprising:

(a) a cutter vehicle arranged to be moved along a row of trees by a powered drive vehicle,

(b) a boom assembly secured to said cutter vehicle and arranged to be secured at its other end to a powered drive vehicle,

(c) said boom assembly being constructed of relatively movable parts which can extend and retract to vary the longitudinal length of said boom assembly,

(d) operating means on said boom assembly arranged to provide powered relative movement of said boom assembly parts to vary the length thereof,

(e) said operating means including release means arranged when actuated to release said movable parts of said boom assembly for free relative movement,

(f) power cutter means on said cutter vehicle arranged to be driven in cutting and retracting movements and arranged in its cutting movement to cut a tree off adjacent the ground,

(g) and control means associated with said cutter means and said operating means on said boom assembly,

(h) said control means having structure capable of actuating said power cutter means to cut a tree substantially simultaneously with the actuation of said release means thereby the movable parts of said boom assembly can have free relative movement and allow the power drive vehicle to advance while said cutter vehicle has stopped momentarily to cut a tree.

4,399,849

QUALITY CONTROL PROCESS

Karol L. Nowakowski, P.O. Box 1054, Bend, Oreg. 97709

Filed Jul. 9, 1981, Ser. No. 281,604

Int. Cl.³ B27M *1/00*

U.S. Cl. 144—364 **6 Claims**

2. A quality control process for lumber-cutting operations, wherein the process comprises:

treating, with a normally invisible indicator, a portion of the lumber to be cut;

recording the physical properties of the portion of lumber;

commingling the treated, recorded portion with the remainder of the lumber;

performing cutting operations on the lumber;

rendering the indicator visible on the treated, recorded portion;

comparing the cut pieces of the treated, recorded portion with the recorded physical properties to determine the efficiency of the cutting operations.

4,399,850

BRACE FOR PLASTIC CANISTERS

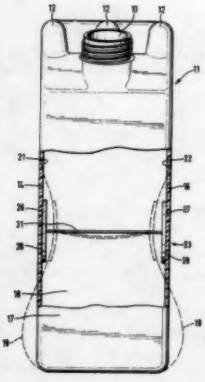
Wolfram Schiemann, Hohenzollernplatzl, 7140 Ludwigsburg, Fed. Rep. of Germany

Filed Feb. 5, 1981, Ser. No. 231,600

Claims priority, application Fed. Rep. of Germany, Dec. 27, 1980, 3049232

Int. Cl.³ B65D *25/02*

U.S. Cl. 150—0.5 **14 Claims**



1. A container made of plastic having two larger side walls and two smaller side walls, in combination with a brace for connecting the two larger side walls of the container,

wherein said container comprises a canister for highly volatile liquids, and

wherein the brace is formed as a separate element of construction arranged to be set inside the canister, and further comprises

two brace ends with one anchor plate at each end, the anchor plates each having an inner and outer surface, whose outer surface is arranged to be joined to a partial region of the inner surfaces of the canister situated opposite each other, said anchor plates being round and made of the same material as said canister side walls,

a pull-brace portion extending from the inner surfaces of the anchor plates, which can be stressed under tension to a stretched state and which in the stretched state has a length equal to the distance between the inner surfaces of the anchor plates,

the pull-brace portion comprises a plane wall,

the pull-brace portion being constructed in such a way that it partially collapses when the side walls move inward.

4,399,851

WHEEL TIRE WITH NOISE ABSORBING MEANS

Oskar Bschorr, Munich, Fed. Rep. of Germany, assignor to Messerschmitt-Boelkow-Blohm Gesellschaft mit beschraenkter Haftung, Munich, Fed. Rep. of Germany

Filed Apr. 17, 1981, Ser. No. 255,245

Claims priority, application Fed. Rep. of Germany, Apr. 26, 1980, 3016255

Int. Cl.³ B60C *13/00, 5/00, 7/00, 9/00*

U.S. Cl. 152—156 **13 Claims**

1. A tire for a wheel, said tire having a tread portion and side wall portions with respective tire rims, comprising vibration absorber means operatively arranged inside said tire, said vibration absorber means being secured in a force and torque transmitting manner to the inside of said tire for reducing the noise radiation of the tire, said vibration absorber means having a cross-sectional shape with a first portion of given thickness and two second portions of diminishing thickness tapering away from said first portion, whereby the mass of the vibration absorber means diminishes from the thicker first portion to the tapering second portion, wherein at least said thicker first portion is secured in said force and said torque transmitting manner to the inside of said tire, and wherein said vibration absorber means have a tubular cross-section with a hollow channel located off-center in said tubular cross section providing said first portion of given thickness resting against an inner surface of the tire, said tubular cross-section further providing said two tapering second portions having tips reaching each other.

3. A tire for a wheel adapted to be filled with a gas, comprising a plurality of separate channel means (**18**) in the material forming the tire, and a plurality of elongated vibration damping elements, at least one such vibration damping element being operatively held completely enclosed in each of said plurality of separate channel means for damping noise vibrations, each vibration damping element comprising vibration damping embedding material an elongated vibration damping strands, fiber sections or platelets completely embedded in said vibration damping embedding material, and connecting means (**27, 29**) on the outer surface of said embedding material providing a force and torque transmitting connection between the embedding material and the material forming the tire for transmitting vibrations in the tire material into the damping embedding material so that friction between the embedding material and the vibration damping elements converts said vibrations into heat energy to achieve said noise damping.

4,399,852

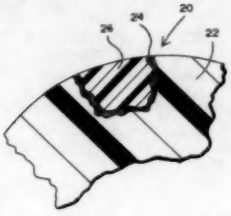
APPLICATION OF AMBIENT TEMPERATURE CURED POLYMERS OR PREPOLYMERS TO A CURED ELASTOMER

Walter R. Hausch, Akron, Ohio, assignor to The Firestone Tire & Rubber Company, Akron, Ohio

Division of Ser. No. 164,127, Jun. 30, 1980, Pat. No. 4,327,138, which is a continuation-in-part of Ser. No. 73,760, Sep. 10, 1979, abandoned. This application Oct. 28, 1981, Ser. No. 316,023

Int. Cl.³ F16L *11/12;* **B32B** *25/04, 25/12, 25/14*

U.S. Cl. 152—353 R **13 Claims**



1. The process of repairing a cured elastomer tire substrate having an opening in its external surface, comprising the steps of:

cleaning the surface of said opening, applying, from a liquid system, at least one treating agent layer, said treating agent layer selected from the group consisting of an N-halohydantoin, an N-haloamide, and an N-haloimide, said treating agent layer effectively bonding to the surface of said opening, and

filling said opening with a liquid system containing an amine curable polymer or a prepolymer in a polar solvent and an amine curing agent, said amine curable polymer or prepolymer effectively bonding to said treating agent layer at ambient temperature.

4. The process of bonding a tread lug laminate to a cured elastomer tire substrate, comprising the steps of:

cleaning the surface of said cured elastomer tire substrate,

applying from a liquid system, at least one treating agent layer, said treating agent layer selected from the group consisting of a N-halohydantoin, an N-haloamide, and an N-haloimide, said treating agent layer effectively bonded to said substrate surface, and

applying to said substrate, in the form of a tread lug, a liquid system containing an amine curable polymer or a prepolymer in a polar solvent and an amine acuring agent, said amine curable polymer or prepolymer effectively bonding to said treating agent layer at ambient temperatures to form a tread lug.

4,399,853

METAL CORD-RUBBER COMPOSITE MATERIALS

Masaaki Morimoto, Sakato; Noboru Kusakabe, Ohme; Koichi Kojima, and Eiichi Koyama, both of Higashimurayama, all of Japan, assignors to Bridgestone Tire Co., Ltd., Tokyo, Japan

Filed Aug. 3, 1981, Ser. No. 289,647

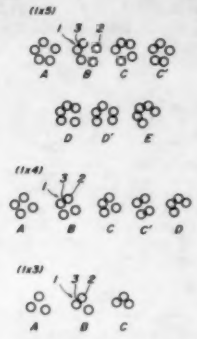
Claims priority, application Japan, Aug. 11, 1980, 55-109135

Int. Cl.³ B60C *9/18;* **D02G** *3/00*

U.S. Cl. 152—359 **8 Claims**

1. A composite material of rubber and metal cords embedded therein, characterized in that said metal cord is produced by twisting at least three metal filaments, and has an elongation under a load of 5.0 kg/cord (P_1) of 0.2–1.2% and an elongation under a load of 2.0 kg/cord (P_2) of $P_2(\%) \leqq 0.947P_1 - 0.043$ prior to the embedding in rubber.

8. A pneumatic tire having metal cords as a reinforcement for a belt layer, characterized in that said metal cord is produced by twisting four or five metal filaments, and has an elongation under a load of 5.0 kg/cord (P_1) of 0.2–1.2% and an elongation under a load of 2.0 kg/cord (P_2) of



$P_2(\%) \leqq 0.947P_1 - 0.043$ prior to the embedding in rubber having a 50% modulus of 10–40 kg/cm².

4,399,854

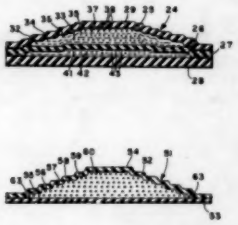
TIRE REPAIR PATCH AND METHOD OF MANUFACTURE

Jobbie DiRocco, 3424 Sweetbriar Ave., Akron, Ohio 44321, and David J. DiRocco, 7090 Grove Rd., Clinton, Ohio 44216

Filed Jun. 15, 1981, Ser. No. 273,978

Int. Cl.³ B60C *21/02, 21/04*

U.S. Cl. 152—367 **14 Claims**



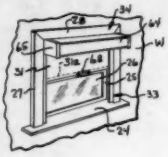
1. A tire repair patch for application to a surface of a tire at an injured portion comprising a ply package of at least two overlapping plies of reinforcing cords, an unvulcanized base cushion gum layer at the underside of said patch for engagement with said surface of said tire, an unvulcanized top cushion gum layer at the opposite side of the patch from said underside, said base and top cushion gum layers being joined at a location beyond the edges of said ply package, each of said overlapping plies of said ply package having a rubber coating and said ply package being at least partially vulcanized prior to assembly with said base cushion gum layer and said top cushion gum layer to increase the strength of said patch and reduce the curing time required to apply said patch to said surface of said tire and said ply package being vulcanized in an amount to provide a unified body having sufficient strength to bridge an injury in a tire surface and prevent deformation into said injury.

4,399,855

ROLL TYPE CLOSURE ASSEMBLY FOR A WINDOW

Boris Volfson, Middleton, Wis., assignor to Graber Industries, Inc., Middleton, Wis.

Filed Feb. 5, 1982, Ser. No. 346,177
Int. Cl.³ E06B 9/08
U.S. Cl. 160—23 R **19 Claims**



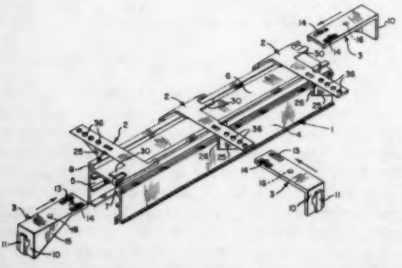
1. A roll type closure assembly for a window opening defined by a window frame, the closure assembly including a roller, a pair of roller mounting brackets for supporting the ends of the roller on a window frame, a flexible panel having one end portion attached to the roller and adapted to be rolled on and unrolled from the roller, a pair of side edge guides for guiding side edge portions of the flexible panel, each side edge guide comprising a unitary extrusion including a lengthwise extending channel portion adapted to receive a side edge portion of the flexible panel and a lengthwise extending mounting flange portion and a lengthwise extending connecting portion intermediate the mounting flange portion to the channel portion, means providing a lengthwise extending flex line in the connecting portion to allow the mounting flange portion and the channel portion to be moved relative to each other between a first position extending generally perpendicular to a plane bisecting the channel portion for mounting on the window frame inside of the window opening and a second position extending generally parallel to a plane bisecting the channel portion for mounting on the window frame outside the window opening.

4,399,856

ADJUSTABLE VALANCE SUSPENSION BRACKET

Richard N. Anderson, Owensboro, Ky., assignor to Hunter Douglas, Inc., Totowa, N.J.

Filed Aug. 27, 1981, Ser. No. 296,974
Int. Cl.³ E06B 9/00
U.S. Cl. 160—39 **10 Claims**



1. An adjustable valance suspension bracket for suspending a valance from a headrail of an inverted channel cross-section having front and rear flanges joined by an upper web, said flanges having adjacent the web elongated recesses extending the length of the headrail, characterized in that said bracket has:

(i) a base including,

(a) fastening means for fastening said base along said headrail,

(b) a first dovetail on said base extending parallel to the headrail, and

(c) a third dovetail extending perpendicular to said first dovetail, and;

(ii) a clip including,

(a) a second dovetail for slidably engaging either of said first dovetail or said second dovetail, and

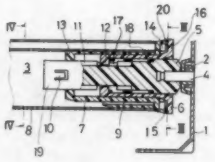
(b) valance connection means on the end of said clip for supporting a valance.

4,399,857

ROLLER ASSEMBLY FITTING DEVICE FOR USE IN A ROLLER BLIND

Kazuo Honma, Tokyo, Japan, assignor to TOSO Kabushiki Kaisha, Tokyo, Japan

Filed Aug. 11, 1981, Ser. No. 291,950
Claims priority, application Japan, Aug. 29, 1980, 55-121909
Int. Cl.³ A47H 1/13
U.S. Cl. 160—323 R **5 Claims**



1. A roller assembly fitting device for use in a roller having a roller assembly supported by a pair of mounting brackets and provided with a hollow roller on which a screen is wound, said device comprising a roller-end sleeve removably secured to the hollow roller, a guide sleeve coaxially mounted in said roller-end sleeve, said guide sleeve being rotatable between first and second angular positions in said roller-end sleeve, a pivot retractably mounted in said sleeves, said pivot passing through the respective bores in said roller-end and guide sleeves and having in the outer periphery thereof an annular step and axial and peripheral grooves, a coil spring interposed between said step and the bottom of said guide sleeve to bias them in opposite directions, said roller-end sleeve having an inner radial projection fitted in said axial groove for rotation with said pivot, said guide sleeve having an inner radial projection for selectively fitting engagement with said axial and peripheral grooves, whereby the radial projection of said guide sleeve locates in said axial groove to permit the retraction of the pivot when said guide sleeve is in the first angular position but enters said peripheral groove to lock the retraction of the pivot when said guide sleeve shifts to the second angular position.

4,399,858

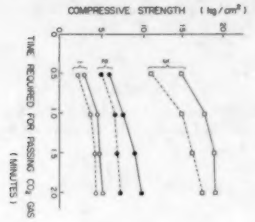
METHOD FOR PRODUCING FOUNDRY MOLD FOR METAL CASTING

Hyojiro Kurabe, Fujimi; Akira Muramatsu, and Toshisada Makiguchi, both of Tokyo, all of Japan, assignors to National Research Institute for Metals, Tokyo, Japan

Filed Mar. 5, 1981, Ser. No. 240,613
Claims priority, application Japan, Mar. 5, 1980, 55-26705
Int. Cl.³ B22C 9/12, 9/00, 1/18
U.S. Cl. 164—16 **3 Claims**

1. In a method for producing a mold for metal casting capable of being easily disintegrated by water which comprises the steps of kneading alumina sand with hydrous sodium aluminate as a binder, forming the kneaded mixture into the desired mold shape and then passing carbon dioxide gas through the mold to decompose sodium aluminate and harden it, wherein said hy-

drous sodium aliminate has an Na_2O/Al_2O_3 ratio of from 1.3 to 1.7 and a water content of from 45 to 55% by weight; the improvement wherein the kneading of alumina sand with the



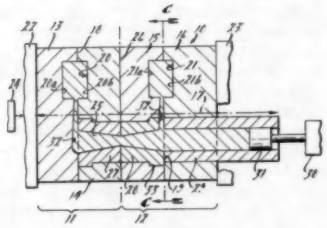
binder before mold formation is carried out in an atmosphere of carbon dioxide gas to decompose 50 to 80% of the sodium aluminate prior to forming the kneaded mixture into the desired molded shape.

4,399,859

DIECASTING ASSEMBLY

Jacques N. Marcil, Warren, Mich., assignor to Ford Motor Company, Dearborn, Mich.

Filed Nov. 13, 1980, Ser. No. 206,429
Int. Cl.³ B22D *17/26, 17/00, 17/04, 17/22*
U.S. Cl. 164—342 **3 Claims**



1. A multiple casting die assembly for use in a die casting process, comprising:

(a) independent plural pairs of mating die members abuttingly arranged in series to meet at abutting planes along a predetermined clamping axis, the die members of each pair having walls defining mating casting cavity portions meeting at a parting plane, said abutting planes and parting planes being parallel to each other and normal to said clamping axis;

(b) means defining a sprue channel for simultaneously communicating with each said cavity portions, said sprue channel extending through said pairs of die members and perpendicular to said parting planes; and

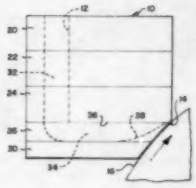
(c) means for selectively clamping said members together in said series arrangement and along said axis and for forceably separating said pairs of die members to break the cast metal in said sprue at said abutting planes remote from said parting planes and to sequentially separate said die members within each pair at said parting planes, the separation means comprising opposed pull bars, each secured to a platen and having a shoulder at its outermost extremity, said shoulder of each pull bar engages one die member of the pair of die members opposite the platen to which the pull bar is secured, and a lock means to hold each of said pairs of die members together while the platens are moved apart, thus the pairs of die members are separated first along said abutting planes, upon reaching a predetermined distance between the platen and the opposite pair of die members the shoulder engages said one die member causing said one die member to remain at that position while separation along the parting plane occurs upon further separating movement of said platens.

4,399,860

APPARATUS FOR STRIP CASTING

Robert H. Johns, Natrona Heights, Pa., assignor to Allegheny Ludlum Steel Corporation, Pittsburgh, Pa.

Filed Oct. 3, 1980, Ser. No. 193,766
Int. Cl.³ B22D *11/06, 11/10*
U.S. Cl. 164—423 **34 Claims**



34. An apparatus for continuously casting strip material comprising:

a tundish having an internal cavity for receiving and holding molten metal, and an orifice passage through which the molten metal is delivered from the cavity to a casting surface, located within about 0.020 inch from the orifice passage and movable past the orifice passage at a speed of from 200 to 10,000 linear surface feet per minute,

said tundish having at least one molten metal resistant upper block, one molten metal resistant lower block and at least one molten metal resistant intermediate block vertically aligned and clamped sufficiently to prevent molten metal in the cavity from passing through the interface of the secured blocks, and

said orifice passage formed between the lower block and an inside surface with respect to the orifice passage, of a boron nitride plate disposed within an intermediate block adjacent said lower block, said orifice passage having a substantially uniform width dimension of about 0.030 to 0.050 inch through the longitudinal extent thereof,

said cavity consisting of at least one tubular introductory cavity extending from the upper block through the intermediate blocks in communication with the base cavity formed in a section of the lower block with the majority of a bottom surface of the base cavity disposed below the height of the orifice passage and extending upwardly toward the orifice passage at an angle of at least about 30° from horizontal, and

at least one heating lance directed through a portion of the tundish for directing heating gases against a graphite coating on an outside surface, with respect to the orifice passage, of the boron nitride plate to heat said plate, and at least one aperture in the tundish through which combustion products from the lance may escape the tundish.

4,399,861

CASTING GAP CONTROL SYSTEM

Charles E. Carlson, Succasunna, N.J., assignor to Allied Corporation, Morristown, N.J.

Continuation-in-part of Ser. No. 74,348, Sep. 11, 1979, abandoned. This application Dec. 22, 1980, Ser. No. 219,032
Int. Cl.³ B22D *11/16, 11/00, 11/10;* **G01B** *11/02*
U.S. Cl. 164—453 **10 Claims**

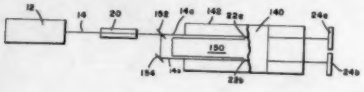
10. In an improved method for flow casting metal strip onto the rapidly moving surface of a chill body of the type in which molten metal is passed from a crucible, through a generally rectangular orifice oriented with long sides generally perpen-

dicular to the direction of motion of the chill surface, across a gap defined by the distance between the crucible and the chill surface, and onto the chill surface the improvement comprising:

(a) setting a desired value for the gap;

(b) provide a gap measurement means, including a light source for providing a focused light beam at each of the two short sides of the orifice, beam-shifting means for continually scanning the beam across the gap at the short sides of the orifice, and detection means associated with the beam shifting means for sensing time-varying intensities of the light beam after they have passed through the gap;

(c) measuring the gap by providing the two focused light



beams, continually scanning the gap with a light beam at each of the two shorter sides of the rectangular orifice, and measuring the time-varying intensity of the light beams after they have passed through the gap;

(d) comparing measured values of the time-varying intensities of the light beams with the desired values and generating deviation signals in response to a comparison of the measured and the desired values that indicate any differences; and

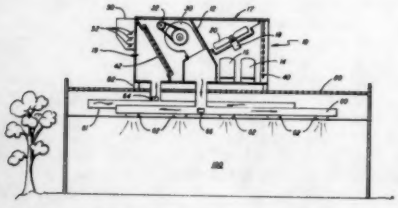
(e) translating the crucible perpendicular to the direction of the travel of the chill surface in response to one deviation signal and for rotating the crucible, about an axis parallel to the direction of travel of the chill surface, in response to an other deviation signal, so as to minimize the differences.

4,399,862

METHOD AND APPARATUS FOR PROVEN DEMAND AIR CONDITIONING CONTROL

James R. Hile, Kirkville, N.Y., assignor to Carrier Corporation, Syracuse, N.Y.

Filed Aug. 17, 1981, Ser. No. 293,056
Int. Cl.³ G05D *23/32;* F25B *13/00*
U.S. Cl. 165—2 **10 Claims**



1. A method of controlling an air conditioning unit which is recurrently energized to condition an enclosure for a time interval, said air conditioning unit including a fan for circulating air through the enclosure to the air conditioning unit and a refrigeration circuit for removing heat energy from the air of the enclosure which comprises the steps of:

energizing the fan to circulate air from the enclosure to the air conditioning unit;

sensing the temperature of the air being circulated to the air conditioning unit;

detecting the temperature of the air after it has been circulated in heat exchange relationship with the refrigeration circuit;

energizing the refrigeration circuit upon an appropriate temperature being ascertained by the step of detecting; and

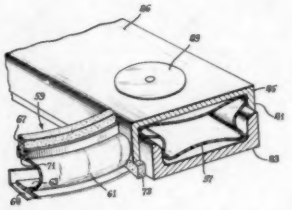
preventing the step of energizing until the temperature ascertained by the step of sensing exceeds a predetermined threshhold temperature upon startup of the air conditioning unit at the beginning of a time interval.

4,399,863

FLOATING SEAL SYSTEM FOR ROTARY DEVICES

Hubert A. Banasiuk, Chicago, Ill., assignor to Institute of Gas Technology, Chicago, Ill.

Filed Dec. 21, 1981, Ser. No. 332,380
Int. Cl.³ F28D *19/00*
U.S. Cl. 165—9 **32 Claims**



1. A floating seal system for rotary exchanger mechanisms operated between support members within a divided duct to reduce gas leakage around the periphery of the rotary device and across the face of the rotary device, said seal system comprising peripheral and radial seals comprising:

an outer peripheral seal secured to an outer peripheral surface of said support member juxtapositioned to an outer peripheral flange of said rotary device, said peripheral seal body made of resilient material having a generally U-shape cross section of two legs joined at one end by a central section, one of said legs secured to said support member outer peripheral surface and the other of said legs having on its outer surface low friction material for contact with said rotary device outer peripheral flange, said legs forming an extended angle of intersection of about 10° to about 30° in the unloaded condition to provide even sealing forces against said rotary device outer peripheral flange in loaded condition, said peripheral seal extending completely around the periphery of said support member except where intersected by said radial seals;

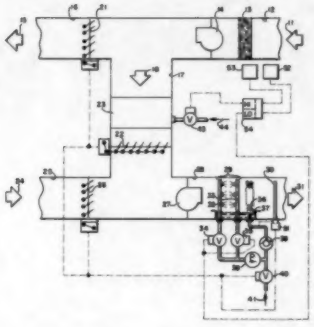
a radial seal assembly secured to said support member along the divider of said duct, said radial seal assembly comprising a smaller channel bar secured to said divider of said support member, a larger inverted, rigid, floating channel bar having its legs freely movable over the legs of said smaller channel bar and forming a tubular channel therewith, a resilient flexible tube positioned within said tubular channel for substantially its full length to reduce gas leakage across said tubular channel, a spacer near each end of said floating channel extending beyond the face of said floating channel a distance to provide desired clearance between said floating channel and the face of said rotary device, said spacer at each end of said floating channel maintained in contact relation with contact surfaces of said rotary device by spring means near each end of said floating channel coacting between said smaller channel and said floating channel thereby maintaining a controlled clearance between the face of said rotary device and the face of said floating channel bar; and

said peripheral seal ends abutting the legs of said floating channel of each said radial seal assembly.

4,399,864
CONTROLLING ROOM-AIR TEMPERATURE AND HUMIDITY IN AN AIR-CONDITIONING SYSTEM

Roger H. Lamar, Winston-Salem, N.C., assignor to The Buhnson Company, Winston-Salem, N.C.

Filed Dec. 10, 1981, Ser. No. 329,302
Int. Cl.³ F24F *3/14*; G05D *21/00*
U.S. Cl. 165—20 **11 Claims**



1. In an air conditioning system to maintain a selected dry bulb temperature and relative humidity in a work space, said system having

an air washer with an inlet connected to damper-controlled recirculated-air and fresh-air ducts and an outlet connected to work-space inlets, an absolute moisture controller connected to said dampers and operable normally to maintain the dewpoint temperature in said outlet at a substantially constant level, and throttling means to modulate the flow of water through said washer;

heater means in a duct upstream of said air washer and a heat controller to modulate the heating effect of said heating means; and

a humidistat and a thermostat in said work space connected to a selector;

said selector operable upon an increase in the relative humidity or reduction in the dry bulb temperature from said selected values to first operate said throttling means to reduce the flow of water and thereafter to activate said heat controller to add heat to the recirculated-air duct, and operable thereafter upon reduction in the relative humidity or an increase in the dry bulb temperature to inactivate the heat controller prior to inactivating said throttling means.

4,399,865
CONCENTRIC STEAMING STRING DOWNHOLE APPARATUS

Glenn W. Anderson, Oildale, and Stanley O. Hutchison, Bakersfield, both of Calif., assignors to Chevron Research Company, San Francisco, Calif.

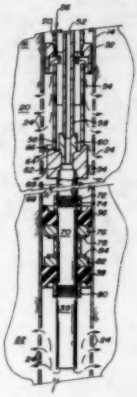
Filed Jul. 20, 1981, Ser. No. 284,748
Int. Cl.³ E21B *33/126, 36/00, 43/24*
U.S. Cl. 166—191 **6 Claims**

2. A steam injector assembly for use at a subsurface location along a perforated cased well with a steam injection, tubing string consisting of separate concentric inner and outer tubing elements comprising:

(a) deflecting means supported on said tubing string for deflecting steam from within said outer tubing element outward from said outer tubing;

(b) means supported on said tubing string for discharging steam from within said inner tubing element outward from said inner tubing;

(c) hollow packer means supported on said tubing string for separating said steam from said deflecting means from said discharged steam;

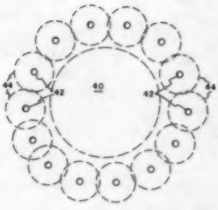


(d) and a cross-over means for terminating said outer tubing and for connecting said inner tubing to said packer means.

4,399,866
METHOD FOR CONTROLLING THE FLOW OF SUBTERRANEAN WATER INTO A SELECTED ZONE IN A PERMEABLE SUBTERRANEAN CARBONACEOUS DEPOSIT

James D. Dearth, Dallas, Tex., assignor to Atlantic Richfield Company, Los Angeles, Calif.

Filed Apr. 10, 1981, Ser. No. 253,114
Int. Cl.³ E21B *33/138, 43/247, 43/30*
U.S. Cl. 166—245 **5 Claims**



1. A method for controlling the flow of subterranean water into a selected zone in a permeable subterranean coal deposit, said method consisting essentially of:

(a) positioning a plurality of wells about said selected zone and in fluid communication with said permeable deposit;

(b) injecting an aqueous plugging material into at least all of said wells simultaneously at substantially the same rate in an amount sufficient to fill at least a major portion of the permeable space in said permeable deposit about each injected well and radially outwardly from each injected well for a distance sufficient to form injected areas of a size such that the injected areas so formed by the injection of such aqueous plugging material overlap to form a barrier about substantially the total perimeter of said selected zone to prevent the flow of subterranean water into said selected zone; and

(c) injecting water into said permeable deposit in said selected zone during the injection of said aqueous plugging material into said wells to limit the entry of said aqueous

plugging material into said selected zone during the injection of said plugging material;

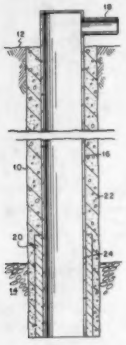
(d) maintaining said aqueous plugging material in position in said formation until said material has plugged the formation sufficiently to inhibit the flow of water through said injected areas.

4,399,867

METHOD FOR INJECTING A GASEOUS STREAM INTO A HOT SUBTERRANEAN ZONE

Herbert B. Wolcott, Plano, Tex., assignor to Atlantic Richfield Company, Los Angeles, Calif.

Filed May 14, 1981, Ser. No. 263,625
Int. Cl.³ E21B *36/00, 43/24*
U.S. Cl. 166—261 **6 Claims**



1. A method for injecting a gaseous stream into a subterranean zone in underground coal gasification processes wherein elevated temperatures occur in said subterranean zone; said method consisting essentially of:

a. positioning a casing means in fluid communication with said hot subterranean zone and the surface;

b. insulating a lower portion of the outer surface of said casing, said lower portion including the portion of said casing in the zone of elevated temperature in said subterranean zone by positioning an insulating material having a meeting point above 3500° F. about the outer surface of said casing prior to cementing said casing in position; and

c. injecting said gaseous stream comprising a mixture of gases including at least one free oxygen containing gas into said subterranean zone through said casing at a rate sufficient to maintain said lower portion below a temperature of about 900° F. when elevated temperatures occur in said subterranean zone.

4,399,868

UNPLUGGING BRINE-SUBMERGED PERFORATIONS

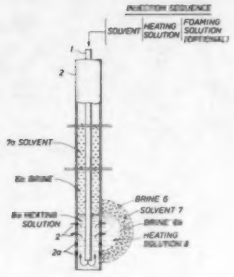
Edwin A. Richardson, Houston, Tex., and Walter B. Fair, Jr., Slidell, La., assignors to Shell Oil Company, Houston, Tex.

Filed Sep. 30, 1981, Ser. No. 307,035
Int. Cl.³ E21B *37/00, 43/25*
U.S. Cl. 166—300 **4 Claims**

1. A well treating process, for bringing heat and oil solvent into contact with plugged fluid passageways which extend between the borehole and reservoir and are covered by a column of relatively dense brine, comprising:

compounding a self-reactive heating solution which (a) consists essentially of an aqueous liquid solution of nitrogen-generating reactants arranged for yielding heat and gas at a significant but moderate rate at the reservoir temperature and (b) contains enough total dissolved solids to provide a solution density exceeding that of the brine in the borehole;

flowing at least one slug each of said heating solution and a liquid oil solvent which becomes a hot liquid solvent for petroleum type compounds at the temperature yielded by the heating solution into the well at a flow rate and sequence such that (a) a significant portion of the heating solution sinks into the column of brine in the borehole and reacts to yield heat and gas that contact the plugged fluid



passageways and (b) a significant portion of the oil solvent is heated by the reaction and is displaced into contact with the plugged passageways; and

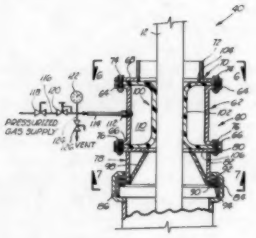
removing the resulting solution or dispersion of plugging materials in aqueous or oleaginous liquid by producing fluid from the well.

4,399,869

PIPE WIPING METHOD AND APPARATUS

Norman P. Bentley, Wheeler, Tex., assignor to Charlies Rental, Wheeler, Tex.

Filed Oct. 27, 1982, Ser. No. 437,119
Int. Cl.³ E21B *33/08*
U.S. Cl. 166—311 **6 Claims**



1. A method of preventing the loss of drilling fluid, oil and other similar substances from a wellbore on the outer surfaces of drill pipe when the drill pipe is pulled out of the wellbore comprising the steps of:

placing an inflatable annular pipe wiping member formed of resilient material over said wellbore and around said drill pipe;

inflating said pipe wiping member with a pressurized gas to a pressure level whereby said pipe wiping member is brought into forcible wiping contact with said drill pipe when said drill pipe is pulled out of said wellbore;

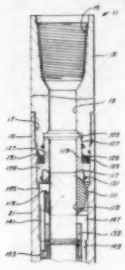
pulling said drill pipe through said pipe wiping member as said drill pipe is pulled out of said wellbore so that drilling mud, oil and other substances on said drill pipe are wiped therefrom and returned to said wellbore; and

deflating said pipe wiping member whereby said pipe wiping member is removed from forcible contact with said drill pipe when said drill pipe is rotated or moved downwardly.

4,399,870
ANNULUS OPERATED TEST VALVE

John L. Baugh, Huntsville; James W. Montgomery, Houston, and Phillip H. Manderscheid, Cypress, all of Tex., assignors to Hughes Tool Company, Houston, Tex.

Filed Oct. 22, 1981, Ser. No. 313,901
Int. Cl.[3] E21B *34/14*
U.S. Cl. 166—324 10 Claims



1. In a well annulus operated valve for drill string test tools having a ball rotatable between an open position to allow flow through the drill string for testing and a closed position to block flow through the drill string during placement and retrieval operations, wherein the improvement comprises:

a pair of shifting linkages extending from opposite sides of said ball, said linkages being adapted to shift in opposite relative directions to open and close said ball;

a pressure operated inner mandrel slidably engaging the first of said shifting linkages, said mandrel being movable between extended and retracted positions responsive to pressures in the well annulus, thereby shifting said first linkage to rotate said ball;

pressure balancing means movable between an active position responsive to pressure in the well annulus to prevent movement of said inner mandrel and a static position to allow movement of said inner mandrel; and

actuating means for moving said pressure balancing means between said active and static position.

4,399,871
CHEMICAL INJECTION VALVE WITH OPENABLE BYPASS

Joel E. Adkins, Carrollton; Gregg W. Stout, Montgomery, and Russell A. Johnston, Lewisville, all of Tex., assignors to Otis Engineering Corporation, Dallas, Tex.

Filed Dec. 16, 1981, Ser. No. 331,251
Int. Cl.[3] E21B *34/00*
U.S. Cl. 166—325 27 Claims

1. A device for controlling flow between the interior and the exterior of a well flow conductor, comprising:

a. a housing connectable to said flow conductor and having inlet means and outlet means and a main flow passage connecting said inlet means with said outlet means;

b. annular valve seat means in said housing providing a seat surface surrounding said main flow passage;

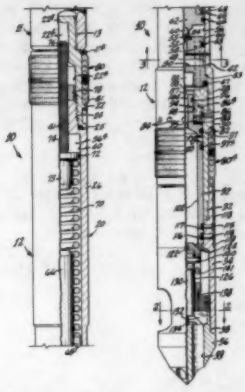
c. valve means including a valve tip engageable with said seat surface for controlling flow through said seat;

d. a bypass passage communicating the exterior of said housing with said main flow passage at a location between said oulet means and said annular valve seat;

e. means initially closing said bypass passage and being movable to open position when the pressure at said outlet means exceeds the pressure at said inlet means by a predetermined amount; and

f. valve means operator means, including:

i. means for biasing said valve tip towards a position of engagement with said seat surface, and

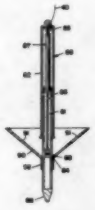


ii. pressure responsive means for biasing said valve tip away from said seat surface when the pressure exterior of said housing reaches a predetermined value.

4,399,872
GUIDELINELESS SYSTEM FOR RISER ENTRY/REENTRY THAT PERMITS QUICK RELEASE OF A RISER COLUMN FROM A SUBSEA INSTALLATION

Robert C. McConaughy, Walnut Creek, Calif., and Joe W. Wright, Lafayette, La., assignors to Chevron Research Company, San Francisco, Calif.

Continuation of Ser. No. 132,571, Mar. 21, 1980, abandoned. This application Jan. 18, 1982, Ser. No. 340,144
Int. Cl.[3] E21B *7/128*
U.S. Cl. 166—341 20 Claims



1. A guidelineless system for use in positioning a riser column on a subsea installation at a well site, the system permitting quick attachment or release of the riser column from the subsea installation, comprising:

a first telescopic guidepost affixed at the lower end of the riser column and movable between an extended position and a retracted position;

a second telescopic guidepost affixed at the lower end of the riser column on a side opposite to said first guidepost, said second guidepost movable between an extended position and a retracted position;

a first means affixed at the upper end of the subsea installation for receiving said first guidepost;

a second means affixed at the upper end of the subsea installation on a side opposite to said first means for receiving said second guidepost;

means for locating the subsea installation;

means for moving the riser column toward the subsea installation wherein said first guidepost is in its extended position to engage said first means and said second guidepost is in its extended position to engage said second means to position the riser column on the subsea installation; and

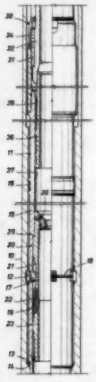
means for disconnectably connecting the riser column to the subsea installation after said first and said second guideposts have been positioned in said first and said second means, said first and said second guideposts when in their retracted position not contacting said first and said second means.

4,399,873

RETRIEVABLE INSERT LANDING ASSEMBLY

Hiram E. Lindsey, Jr., Midland, Tex., assignor to MWL Tool and Supply Company, Midland, Tex.

Filed Jun. 16, 1981, Ser. No. 274,284
Int. Cl.³ E21B *23/03, 23/04*
U.S. Cl. 166—380 **12 Claims**



1. A method of setting a retrievable insert landing assembly in a packer bore receptacle in a well bore comprising the steps of:

lowering a retrievable inset landing assembly and coupling tool on a string of tubing through a string of pipe containing a packer bore receptacle until the retrievable insert landing assembly is sealingly received in the packer bore receptacle and is seated therein;

dropping a sealing ball through the tubing string to seal off the cross-section of the landing assembly so that a setting force may be applied to the retrievable insert landing assembly;

applying hydraulic pressure to said tubing string after the ball is seated in the landing assembly for latching said insert retrievable insert landing assembly to a packer bore receptacle;

disconnecting said coupling tool from the retrievable insert landing assembly after the actuation of the retrievable insert landing assembly while providing a sliding seal between said coupling tool and said landing assembly so that it is not necessary to halt production of the well to retrieve the tubing after setting of said landing assembly.

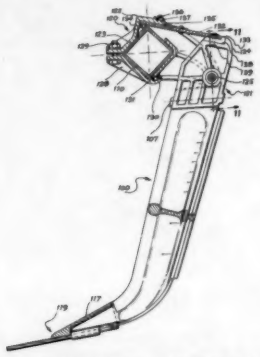
4,399,874

AGRICULTURAL TOOL SHANK AND SPRING RELEASE

John W. Ryan, Yowie Bay, Australia, assignor to Agrowplow Pty Limited, Australia

Continuation of Ser. No. 932,023, Aug. 8, 1978, abandoned. This application Jul. 31, 1980, Ser. No. 174,176
Claims priority, application Australia, Aug. 9, 1977, PD1154
Int. Cl.³ A01B *23/02, 61/04*
U.S. Cl. 172—269 **18 Claims**

1. A rigid plough shank for use in soil, including: a generally vertical upper part attachable to a plough frame for being drawn thereby, and a lower part adapted to receive and support a digging point; said upper part having a leading portion with a leading surface having a rounded horizontal profile; a trailing portion; a web connecting the trailing and leading portions; said leading and trailing portions having a transverse width greater than that of said web, whereby the shank has a horizontal cross-section for inhibiting flexure of the shank as it moves through the soil, so that the digging point attached thereto is held at a substantially fixed location relative to the plough frame and in a substantially fixed attitude; attachment means disposed at the top of the shank, permitting attachment



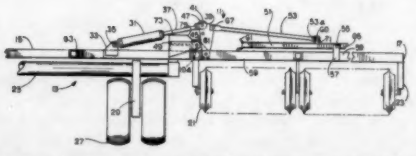
of the shank to a plough frame, whereby, said leading surface is inclined rearwardly and upwardly by 60° to 80° to the horizontal, said inclination in combination with said profile, inhibiting collection of trash on the shank in use; said lower part having a generally horizontal forwardly extending portion and means for receiving and supporting a digging point, and further defined by said leading surface terminating in a forwardly facing arcuate section joining said upper and lower parts inhibiting wear of the shank in that region of the shank and to enhance soil flow past the shank in that region.

4,399,875

AUTOMATIC SUPPORT FOR FOLDING WING FRAME IMPLEMENT

Wayne J. Schaaf, and Bennie J. Boswell, both of Kewanee, Ill., assignors to Chromalloy American Corporation, St. Louis, Mo.

Filed Apr. 26, 1982, Ser. No. 372,159
Int. Cl.³ A01B *73/00*
U.S. Cl. 172—311 **16 Claims**



10. In an implement having a main frame section and at least one wing frame section pivotally connected to said main frame section for movement between a lowered outwardly extended position and an upwardly folded position wherein said wing frame section forms an included angle of less than 90° with said main frame section, an automatic support apparatus operatively associated with said main and wing frame sections and operative to support said wing section when in said upwardly folded position, said automatic support apparatus comprising:

a support arm pivotally connected generally adjacent one end to said wing frame section and adapted to lie in relatively close proximity to said wing frame section so as to provide a low profile when said wing frame section is in

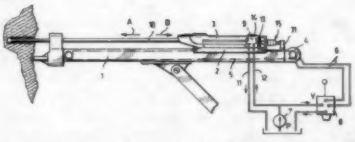
said extended position, a pivot link pivotally connected to said wing frame section at a position spaced from the pivotal connection of said support arm to said wing frame section, a connecting link pivotally connected to said pivot link and said support arm such that said pivot link, connecting link, support arm and wing frame section form a four-bar linkage arrangement, actuating means operatively associated with said main and wing frame sections and operative to effect movement of said wing frame section between its said lowered and folded positions, and control means cooperative with said pivot link so as to effect predetermined movement thereof during movement of said wing frame section between its said lowered and folded positions, said four-bar linkage arrangement being configured to effect automatic movement of said support arm into supporting relation with said main frame section as said wing frame reaches its folded position.

4,399,876

REVERSING MECHANISM FOR THE DIRECTION OF ROTATION IN A DRILLING APPARATUS

Ossi Tienari, Kilvakkala, Finland, assignor to OY Tampella AB, Tampere, Finland

Filed Aug. 17, 1981, Ser. No. 293,422
Claims priority, application Finland, Sep. 10, 1980, 802838
Int. Cl.³ B23Q *5/033*
U.S. Cl. 173—147 **8 Claims**



1. A reversing mechanism for the direction of rotation in a drilling apparatus comprising a feeding beam (**1**), a drilling machine (**3**) displaceably mounted on said feeding beam, and a feeding mechanism (**4**) for displacing said drilling machine along said feeding beams in a drilling direction (A) and in an opposite retu..n direction (B), said drilling machine being provided with a pressure medium driven rotating device (**9**) for rotating a drilling rod (**10**) to be fastened to said drilling machine and with a reversing valve (**13**) connected to the pressure medium system of said rotating device and having a spindle (**16**) rotatable between two positions in which said rotating device rotates said drilling rod in opposite directions, and means for rotating said spindle into said positions, characterized in that said reversing mechanism (**15**) comprises two actuating elements (**24,27**) rotationally mounted with respect to each other, one (**24**) of said elements being in rotational engagement with the spindle (**16**) of said reversing valve (**13**) and moving axially with said spindle at least at the end of said return direction (B) of the drilling machine and the other (**27**) of said elements being arranged to maintain non-rotating and stationary at the end of said return direction (B) but to rotate and move axially with respect to said one actuating element (**24**) at the beginning of said drilling direction (A) of said drilling machine, and in that said actuating elements are provided with means (**28,29**) for forcing said actuating elements to rotate with respect to each other as they move in the axial direction of said spindle (**16**) with respect to each other.

4,399,877

CONTINUOUS BOREHOLE TELEMETRY SYSTEM AND METHOD

Joshua M. Jackson, and Vernon E. Koval, both of Houston, Tex., assignors to NL Sperry Sun, Inc., Houston, Tex.

Filed Apr. 17, 1981, Ser. No. 255,024
Int. Cl.³ E21B *7/04, 17/00, 47/022*
U.S. Cl. 175—45 **22 Claims**

1. A borehole survey system for use in a drill string drilling substantially horizontal boreholes, comprising:

a pipe string having a drill bit at its lower end;

motive means for operating the drill bit in the pipe string;

instrument means positioned in the pipe string near the drill bit for providing directional information to permit steering of the drill bit;

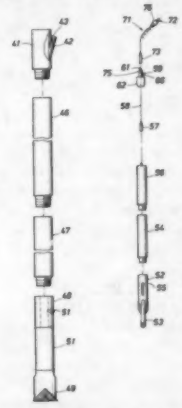
side entry means near the upper end of the pipe string for permitting passage of an electrical cable from the exterior to the interior of the pipe string;

hanger means positioned within each section of pipe making up the pipe string; and

electrical conductor means positioned in each section of pipe and having a portion thereof arranged for seating in said hanger means;

said electrical conductor means are longer than the section of pipe in which they are positioned and further including connector means on each end of said conductor means.

11. A method for directionally surveying a substantially horizontal borehole being drilled under the earth's surface, wherein such borehole is drilled by means of a bit rotated on the end of a pipe string, comprising:



positioning a directional survey tool in the pipe string near the drill bit;

positioning lengths of electrical conductor in each drill pipe section to be added to the pipe string, with such conductor lengths being longer than the pipe sections and having connector portions accessible at the top and bottom of the pipe sections;

connecting adjacent lengths of conductor in adjoining pipe sections before connecting such adjoining pipe sections;

positioning such sections of pipe in the pipe string above the survey tool and connecting the connector at the bottom of conductor in the bottom pipe section to the survey tool;

connecting a side entry pipe at the top of the pipe string;

passing a side entry conductor through the side entry pipe to provide an electrical conductor path from the exterior to the interior of the pipe string; and

electrically connecting the bottom end of the side entry conductor to the conductor connection portion accessible at the top of the uppermost pipe section.

4,399,878

LUBRICATING DEVICE

Harry L. Karlsson, Sandviken, and Lars G. Norlander, Surte, both of Sweden, assignors to Sandvik Aktiebolag, Sandviken and Aktiebolaget SKF, Göteborg, both of, Sweden

Filed Aug. 18, 1981, Ser. No. 293,710
Claims priority, application Sweden, Sep. 26, 1980, 8006734
Int. Cl.³ E21B *10/22*
U.S. Cl. 175—227 **7 Claims**

1. A rotary drill bit comprising:

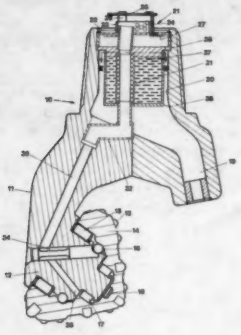
a support,

at least one roller cutter mounted on said support and including cutting means,

bearing means disposed in a bearing cavity between said support and said roller cutter,

at least one first passage means in said support for supplying flushing fluid to a hole being drilled,

at least one reservoir disposed in said support and containing a flowable lubricant,



at least one second passage means in said support and communicating with said bearing cavity for conducting fluid thereto, a portion of said second passage means passing through said reservoir upstream of said bearing cavity and being defined by a porous material which communicates with the lubricant in said reservoir to conduct the lubricant into said second passage means.

4,399,879

BORING HEAD

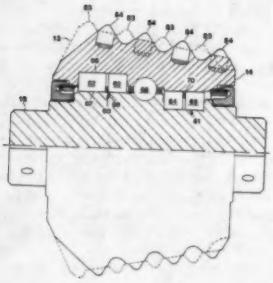
Bernt S. Liljekvist, and Anders E. Persson, both of Sandviken, Sweden, assignors to Santrade Ltd., Lucerne, Switzerland

Continuation-in-part of Ser. No. 114,339, Jan. 23, 1980, Pat. No. 4,274,496. This application May 27, 1981, Ser. No. 267,653

Claims priority, application Sweden, Feb. 2, 1979, 7900922

Int. Cl.[3] **E21B** *10/22;* **F16C** *19/40, 19/49*

U.S. Cl. 175—372 **8 Claims**



6. A boring head for rotary boring of the face of earth formations comprising a plurality of roller cutters which are rotatably journaled on bearing shafts over a bearing system, said bearing shaft being carried by a mounting means on the boring head, said bearing system comprising a roller bearing including rollers which are spaced in the longitudinal direction of the roller cutter, characterized in that the rollers have common races on the bearing shaft and on the roller cutter, and in that a guide ring is arranged between the spaced rollers, said guide ring being loose with respect to the bearing shaft and the roller cutter, the height of the guide ring when measured at a race adjacent thereto is smaller than half the diameter of a roller.

4,399,880

COMBINATORIAL WEIGHING SYSTEM

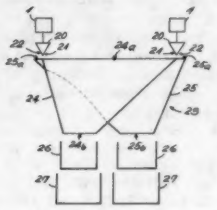
Satoshi Konishi, Shiga, Japan, assignor to Kabushiki Kaisha Ishida Koko Seisakusho, Kyoto, Japan

Filed Jan. 7, 1982, Ser. No. 337,944

Claims priority, application Japan, Jan. 27, 1981, 56-11318; Jun. 27, 1981, 56-100088; Dec. 22, 1981, 56-208828

Int. Cl.[3] **G01G** *19/32*

U.S. Cl. 177—1 **10 Claims**



1. A combinatorial weighing system comprising a plurality of weighing hoppers each having two discharge ports, a plurality of weighing machines respectively associated with said weighing hoppers for weighing articles received in the latter, an arithmetic section for performing combinatorial operation on the basis of weighed data obtained by said weighing machines to search for a combination whose addition value is equal or the closest to a set value and sending a discharge signal to the weighing hoppers corresponding to the searched-for combination, and a chute having a plurality of separate discharge paths for dropping articles from the weighing hoppers toward at least a timing hopper situated thereunder, wherein the two discharge ports of each weighing hopper are respectively associated with the discharge paths of said chute and said discharge ports are actuated by different signals independently of one another.

4,399,881

TRACK WORKING OR TRANSPORT VEHICLE

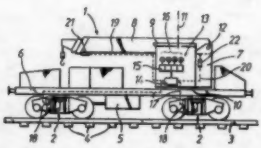
Josef Theurer, and Klaus Riessberger, both of Vienna, Austria, assignors to Franz Plasser Bahnbaumaschinen Industriegesellschaft mbH, Vienna, Austria

Filed Aug. 5, 1980, Ser. No. 175,573

Claims priority, application Austria, Oct. 5, 1979, 6536/79

Int. Cl.[3] **G01G** *19/08, 19/04, 13/14*

U.S. Cl. 177—137 **8 Claims**



1. A track working or transport vehicle comprising

(a) a frame,

(b) two spaced apart undercarriages supporting the frame, each one of the undercarriages having a respective side frame associated with a respective one of the track rails, an axle supported on the side frames and a respective wheel mounted on the axle and running on the respective track rail,

(c) spring means mounted between the side frames of the undercarriages and the frame of the vehicle, each of the spring means having a stroke whose length corresponds

directly to variable loads distributed to a respective one of the wheels from the frame,

(d) a displacement pickup connected to each one of the spring means and arranged to measure the stroke of the spring means connected thereto, the pickup generating an electrical output signal corresponding directly to the measured stroke, and

(e) an arrangement for continuously monitoring and indicating the loads distributed to the respective wheels, the arrangement including

(1) a summation circuit having a first input receiving the output signals from the pickups, a second input receiving fixed electric signals corresponding to the weight of non-yieldingly mounted parts of the undercarriages, and an output transmitting electrical output signals corresponding directly to the wheel loads derived from the inputs, and

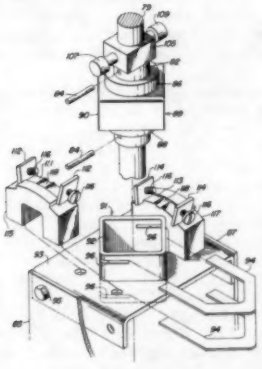
(2) an indicator device receiving each output signal from the summation circuit and correspondingly indicating the wheel loads.

4,399,882

CONTROL MECHANISM FOR A DUAL HYDROSTATIC TRANSMISSION VEHICLE DRIVE SYSTEM

Michael J. O'Neill, Mayville; Peter F. Brautigam, Kewaskum, and David K. Stricker, Juneau, all of Wis., assignors to Deere & Company, Moline, Ill.

Filed Jul. 6, 1981, Ser. No. 280,431
Int. Cl.³ B62D *11/00*
U.S. Cl. 180—6.48 **4 Claims**



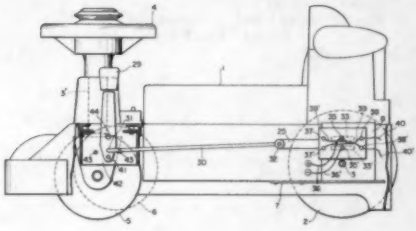
1. In a vehicle having a dual hydrostatic transmission drive system, said dual hydrostatic transmission including first pump and motor units and second pump and motor including first pump and motor units and second pump and motor units for independent operation of said vehicle's drive wheels, said first and second pump units have a respective displacement control shaft extending from said pump units for independent displacement said respective pump units, a control mechanism comprising: a first lever fixably mounted to said first pump unit's control shaft; a second lever fixably mounted to said second pump unit's control shaft; a cross member having a generally horizontal orientation; a first connecting rod pivotally mounted to said first lever and pivotally mounted to one end of said cross member; a second connecting rod pivotally mounted to said second lever and pivotally mounted to the outer end of said cross member; a steering column fixably mounted to such cross member and extending generally vertically therefrom; support means for supporting said steering column, and allowing said steering column to be pivoted about said support means in a forward and rearward direction and allowing rotation of said steering column about the longitudinal centerline of such steering column, including, a first member having a generally cylindrical shape placed around a portion of said steering column; a plurality of pins fixably mounted in and extending through said steering column and first member; an elastromeric member having a generally cylindrical shape fixably mounted around a portion of said first member; housing open at opposing ends having said elastromeric member fixably mounted therein such that said steering column extends through said housings open ends; first means for fixably mounting said housing in said vehicle, whereby pivoting of said steering column causes said pump units to displace with a constant relative displacement, and rotation of said steering column causes said pump units to displace with a differential relative displacement.

4,399,883

TOY VEHICLE

Masatoshi Todokoro, Koganehara 2-chome, Matsudo-shi, Chiba-ken, Japan 270

Filed Apr. 27, 1981, Ser. No. 257,636
Claims priority, application Japan, Jun. 25, 1980, 55-89036
Int. Cl.³ B60K *17/02*
U.S. Cl. 180—65 E **1 Claim**



1. A toy vehicle comprising in combination:

(a) a vehicle body with front and rear sections, a pivoted switch lever (29) at said front section, said switch lever (29) having a forward, disengage and backwards travel positions, a connecting rod (30) coupled at said front section to said switch lever (29) and extending to said rear section;

(b) electric motor means with a feeding terminal and a frame at said rear section, said frame supporting therein a gear train and a follower gear (9), said gear train transmitting the motive power of said motor means to said follower gear (9), a drive axle (3) on which said follower gear (9) is mounted;

(c) a slide shaft (10), with a pinion gear (11) mounted thereon, said pinion gear (11) slidably engaging and disengaging from said follower gear (9) depending on the position of said slide shaft (10), spring means (22) normally biasing said shaft (10) to the position where said pinion gear (11) engages said follower gear (9);

(d) a slidable clutch plate (25) having thereon a protuberance (26) disposed to engage and push said slide shaft (10) against the elastic force of said spring means (22), said clutch plate (25) being connected to said connecting rod (30);

(e) an insulator plate (34) in said rear section;

(f) electroconductive contact pieces (33, 33') on said clutch plate (25) and power terminals (35, 35') disposed and arranged on said insulator plate (34), such that when said protuberance (26) is moved by operating said switch lever (29) away from the position where said protuberance (26) engages and pushes said slide shaft (10), said terminals (35, 35') are connected with said contact pieces (33, 33') to engage said motor;

(g) first and second switching terminals (37, 37'; 38, 38') on said insulator plate (34) at first and second spaced apart

positions with circuits selectively connecting said first and second switching terminals so that when said switch lever (29) is in the forward position, said first switching terminals (37, 37') are connected to said power terminals (35, 35') and the connection is such as to drive the motor in a direction to move the vehicle forward while when said switch lever (29) is in the backwards position, said second switching terminals (38, 38') are connected to the power terminals (35, 35') the connection is such as to drive the motor in a direction to move the vehicle backwards, while when the switch lever (29) is in the disengage position, said protruberance (26) will disengage said pinion gear (11) from said follower gear (9); and,

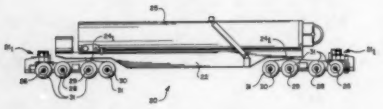
(h) spring loaded stopper protuberance means (41) on said switch lever (29, a wall plate (42) at said front section disposed for engagement by said stopper protuberance means (42), said wall plate (42) having slot means (43) to secure said switch lever in any position.

4,399,884

ANGLE LAG CONTROL METHODS AND APPARATUS FOR LONG GROUND VEHICLES

Marvin E. Vandehey, Seattle, Wash., assignor to The Boeing Company, Seattle, Wash.

Filed Sep. 8, 1981, Ser. No. 300,228
Int. Cl.³ B62D *15/00, 61/10*
U.S. Cl. 180—79.1 **40 Claims**



1. The method of automatically steering the steerable wheels of an unmanned wheeled support pivotally connected to the trailing end of a center frame forming part of a long articulated ground vehicle in response to overall vehicle dynamics including the vehicle dynamics of a controlled power driven wheeled support having steerable wheels and pivotally secured to the leading end of the center frame of the articulated vehicle; said method comprising the steps of:

(a) measuring a parameter indicative of the distance traveled by the vehicle;

(b) measuring the leading angle α_1 between the longitudinal centerlines passing through the center frame and the controlled support as the vehicle traverses a path which is, at least in part, curvilinear so as to produce a first signal representative of the leading angle α_1;

(c) averaging the first signal representative of the leading angle α_1 over time and as a function of the distance traveled to produce a delayed first signal representative of the time average of the leading angle α_1;

(d) measuring the trailing angle α_2 between the longitudinal centerlines passing through the center frame and the unmanned support so as to produce a second signal representative of the trailing angle α_2;

(e) comparing the second signal representative of the trailing angle α_2 with the delayed first signal representative of the time average of the leading angle α_1 and producing a third signal representative of the angular difference between the trailing angle α_2 and the time average of the leading angle α_1; and,

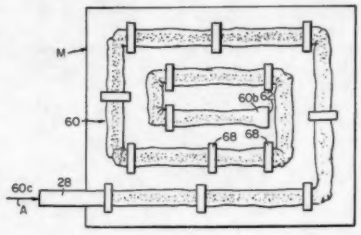
(f) utilizing the third signal to govern a steering controller in the unmanned support for steering the unmanned support through a steering angle β sufficient to maintain the trailing angle α_2 substantially equal to the time average of the leading angle α_1 so that the unmanned support travels over substantially the same path as the controlled support as the articulated ground vehicle traverses the path.

4,399,885

FLEXIBLE FILM AIR PALLET FOR MATERIAL MOVEMENT

Raynor A. Johnson, and Ralph M. Barrow, Jr., both of Newark, Del., assignors to American Industrial Research, Newark, Del.

Division of Ser. No. 48,111, Jun. 13, 1979, Pat. No. 4,298,083.
This application May 21, 1981, Ser. No. 265,923
Int. Cl.³ B60V *1/00*
U.S. Cl. 180—125 **2 Claims**



1. An air pallet for frictionless movement of a load supported thereon by a relatively rigid planar backing member relative to an underlying generally planar fixed support surface, said air pallet comprising:

a thin flexible tube underlying said backing member and directly overlying said support surface and defining internally a plenum chamber, the portion of said thin flexible tube facing said support surface bearing perforations with said perforations unrestrictedly opening into said plenum chamber,

air dispersion means for insuring air flow throughout said plenum chamber when said pallet is under load and air is applied thereto under pressure,

means for controlling pillowing of said thin flexible tube to permit jacking of the backing member and said load sufficient to permit the pallet to accommodate surface irregularities for both said load support surface and said backing member without ballooning, and

air inlet means to the plenum chamber for permitting air under pressure to enter said chamber for jacking said load and for discharge through said perforations to create an air film between said thin flexible sheet and said fixed support surface;

and wherein said thin flexible tube is of elongated form, non-looped, and being wound in loose coil or sinusoidal form about the bottom of said relatively rigid planar backing member with said perforations opening to opposite sides of said tube to permit air to freely escape from the plenum chamber to the atmosphere between the tube windings while providing a limited perforated surface area relative to the load bearing means defined by said backing member with the pressure of the air within the plenum chamber being sufficient to effect jacking of the load and creation of an air film between the perforated portion of the thin flexible tube and said fixed support surface.

4,399,886

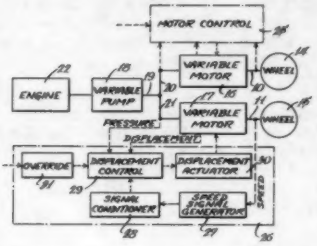
CONTROLS FOR VARIABLE DISPLACEMENT MOTOR AND MOTORS

Frederic W. Pollman, Ames, Iowa, assignor to Sundstrand Corporation, Rockford, Ill.

Filed Dec. 9, 1980, Ser. No. 214,687
Int. Cl.³ B60K *31/00*
U.S. Cl. 180—197 **24 Claims**

1. A hydrostatic drive system for a pair of drive shafts with anti-slip drive characteristics comprising, a pair of variable displacement fluid motors associated one with each of said

drive shafts, a pump in closed circuit with said motors with said motors being connected in parallel with said pump, a pair of movable displacement-setting members associated one with each motor, a pair of signal-generating means associated one with each motor and with each signal-generating means generating a variable signal which increases in value as the speed of



the associated motor increases, and control devices connected one to each of said displacement-setting members and responsive to an increase in the variable signal indicating increased motor speed for reducing displacement of the associated motor with the maximum value of the variable signal achieving zero output torque.

4,399,887

COLLISION SENSING SYSTEM FOR VEHICLES AND ASSOCIATED METHOD

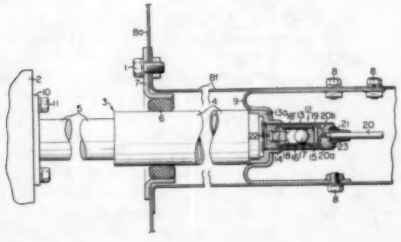
Motohiro Okada, Asaka, Japan, assignor to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Dec. 11, 1980, Ser. No. 215,320

Claims priority, application Japan, Dec. 20, 1979, 54-166186; Dec. 20, 1979, 54-166187

Int. Cl.³ B60R *19/06*

U.S. Cl. 180—282 **19 Claims**



1. A collision sensing system for a vehicle having a vehicle body; a seat-occupant restraining device in a passenger compartment of the vehicle and a collision load bearing portion mounted externally of said body; said collision sensing system comprising damper means including a movable part connected to said collision load bearing portion and a normally stationary part which is displaceable by a force exceeding a predetermined value, said movable part and said normally stationary part being in telescopic relation, an impact energy absorbing member connecting said stationary part to said body; and acceleration sensing switch means coupled to said normally stationary part of said damper means for actuating said seat-occupant restraining device in response to a rearward acceleration of said switch means in excess of a predetermined value, whereby said movable part and said normally stationary part are adapted to be moved in sequence.

4,399,888

SUPPORT GROUP FOR MOUNTING INSTRUMENT AND ELECTRICAL COMPONENTS IN A MOTOR VEHICLE

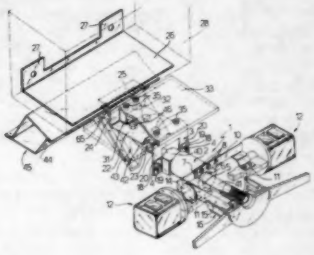
Ugo Contato, Turin, Italy, assignor to Fiat Auto S.p.A., Turin, Italy

Filed Apr. 6, 1981, Ser. No. 251,110

Claims priority, application Italy, Apr. 8, 1980, 67545 A/80

Int. Cl.³ B60K *35/00*; **B60R** *16/02*

U.S. Cl. 180—315 **11 Claims**



1. A motor vehicle support group for mounting an instrument and control device carrier assembly, accessory elements, and an electric interconnection group for the control devices, instruments and accessory elements, in the passenger compartment of the motor vehicle, said support group comprising at least two support parts, means adjustably interconnecting the two support parts, a first of said two parts being adapted to be mounted on the steering column of the motor vehicle, and the second of said two parts being adapted to be secured to a body part of the dashboard of the motor vehicle.

4,399,889

LOAD LOWERING APPARATUS

Walter Todd, 336 Taldan Ave., Virginia Beach, Va. 23462

Filed Mar. 2, 1981, Ser. No. 239,450

Int. Cl.³ A62B *1/14, 1/16*

U.S. Cl. 182—6 **12 Claims**

1. In a load lowering mechanism of the type employed to lower a load along a generally vertical load supporting line by a slider mechanism including manually operable brake means for frictionally engaging the line to slow the rate of movement of the slider along the line, the improvement wherein said slider assembly comprises,

a rigid open frame including a pair of opposed laterally spaced side members,

fastener means rigidly securing said side members in said opposed laterally spaced relation,

harness means for supporting a load for attachment to said slider assembly,

cooperating fastener means on said harness means and said slider assembly operable to releasably attach said harness means to the slider means for movement therewith,

a pair of parallel, vertically spaced shaft members each having opposed ends mounted one on each of said side members for rotation about a fixed, generally horizontal axis and each having a line-receiving opening extending substantially diametrically therethrough, the line extending through said line receiving opening in each said shaft member whereby said slider assembly is slidably mounted on the line, said line receiving openings being dimensioned to enable the line to pass freely therethrough, and

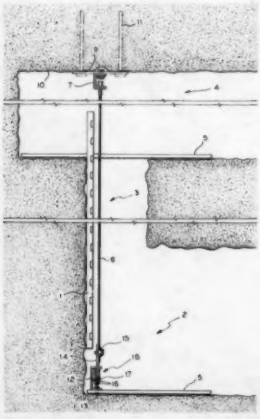
handle means operably connected with said pair of shaft members and being manually operable to rotate said shaft members through a limited angle of rotation whereby frictional contact between said pair of shaft members and the line passing therethrough may be varied, said handle means including first and second link members rotatably fixed one on one end of each said shaft member, and a third link member pivotally connected to said first and second link members, said first, second and third link members cooperating with said frame to define a parallel linkage which is operable to simultaneously rotate each of said shaft members between a first position in which said line receiving openings extend in substantially vertical alignment with the load supporting line extending therethrough in a generally straight line and a second position in which said line receiving openings in said shaft members are substantially misaligned, with the load supporting line following a zigzag path therethrough.

4,399,890

INDEPENDENTLY MOUNTED FALL PREVENTION APPARATUS

Leroy R. Bartels, Hager City, Wis.; John H. Lawson, Red Wing, Minn., and Paul L. King, Stockholm, Wis., assignors to International Telephone and Telegraph Corporation, New York, N.Y.

Filed May 20, 1981, Ser. No. 265,407
Int. Cl.³ A62B *1/20*
U.S. Cl. 182—100 **4 Claims**



1. Safety cable apparatus for use in a fall prevention system adapted for use with a fluid mounted ladder in a mine, said apparatus comprising:

a flexible safety cable;

a mounting plate, said mounting plate being adapted for fastening to the ceiling of said mine by means of mounting pins;

an upper mounting bracket having upper and lower arms and a web interconnecting said upper and lower arms, said upper arm being fixedly mounted to said mounting plate, said lower arm having an aperture;

a pin having a lower portion extending through said aperture and being swaged to said cable, said pin having an upper portion having a diameter greater than the diameter of said aperture, said upper portion being supported by said lower arm;

a lower mounting bracket coupled to the lower end of said cable and fixedly mounted to a floor below said ladder;

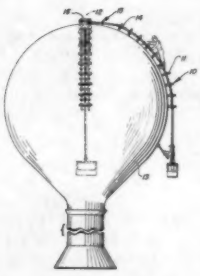
said upper and lower brackets being positioned such that said cable is supported in proximity to said ladder.

4,399,891

ANCHORING DEVICE FOR FLEXIBLE LADDER

Jens A. Heilskov, Madison, Wis., assignor to Ray-Jens Corporation, Wilmington, N.C.

Filed Mar. 11, 1982, Ser. No. 357,046
Int. Cl.³ E06C *1/36, 1/397, 1/56*
U.S. Cl. 182—150 **10 Claims**



1. For use with a flexible ladder having an upper end provided with connecting elements, an improved anchoring device for connecting said upper end to an upstanding annular access manhole projection such as provided on a storage spheroid, said anchoring device comprising:

an arcuate caster support extending at least approximately 180° and having opposite spaced distal ends;

a plurality of casters rotatively mounted to said caster support at circumferentially spaced positions for radially inner rolling engagement with said access manhole projection; and

a flexible connector having ends secured to said caster support distal ends and arranged to have said flexible ladder connecting element movably connected thereto whereby the flexible ladder may be hung from the access manhole projection for ready adjustability on the spheroid about the vertical axis of said access manhole projection.

4,399,892

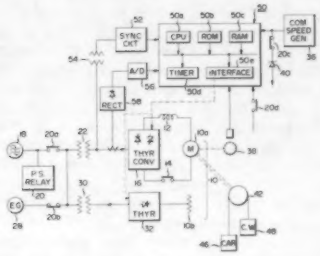
THYRISTOR LEONARD TYPE ELEVATOR CONTROL SYSTEM

Eiki Watanabe, Inazawa, Japan, assignor to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Sep. 9, 1981, Ser. No. 300,978
Claims priority, application Japan, Sep. 18, 1980, 55-129979
Int. Cl.³ B66B *5/02*
U.S. Cl. 187—29 R **5 Claims**

1. A thyristor Leonard type elevator control system comprising an elevator car, a DC motor for driving said elevator car, a three-phase AC source, a thyristor converter normally connected between said three-phase AC source and said DC motor to convert an AC power from said three-phase AC source to a DC power, an emergency three-phase AC generator, changer means responsive to a suspension of said AC power to change the connection of said thyristor converter

from said three-phase AC source to said emergency three-phase AC generator, a command speed generator for generating a command speed signal for said DC motor, command changing means connected to said command speed generator to decrease a magnitude of said command speed signal therefrom in response to the operation of said changer means of connecting said thyristor converter to said emergency three-phase AC generator, and a firing control circuit for connected



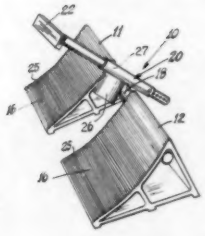
to both said thyristor converter and said command speed generator to control the firing of said thyristor converter in the symmetric mode in response to said three-phase AC source when said thyristor converter is connected to said three-phase AC source, said firing control circuit sensing the operation of said changer means of connecting said thyristor converter to said emergency three-phase AC generator to control the firing of said thyristor converter in the unsymmetric mode in response to the decreased command signal.

4,399,893

LOCKING WHEEL BLOCK

Ralph V. Switzer, Lake Forest, Ill., assignor to The Aldon Company, Waukegan, Ill.

Filed Oct. 29, 1981, Ser. No. 316,083
Int. Cl.³ B60T 3/00
U.S. Cl. 188—32 **6 Claims**



1. A lockable wheel block adapted to be releasably connected between the rims and tires of a dual wheeled vehicle so as to prevent movement of the wheels in either direction comprising:

(a) a pair of base members each providing spaced apart curved ramp faces having inner and outer surfaces, said outer surfaces being adapted to engage the circumferential periphery of the tires,

(b) a horizontal support extending between and fixedly connecting said base members together with said ramp faces in side-by-side spaced apart relation,

(c) an elongated restraining arm mounted upon said support between said base members and extending in a raised radial direction with respect to said ramp faces,

(d) mounting means on said support through which said arm is rotatable and longitudinally movable through a raised radial path with respect to said ramp faces,

(e) means for releasably connecting said restraining arm to said support at preselected positions throughout its length and in a non-rotatable condition, and

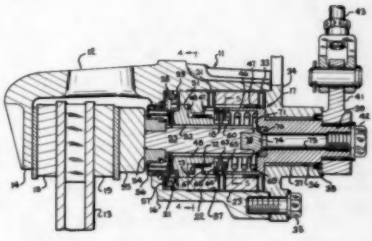
(f) a rim engaging member carried at one end of said restraining arm and rotatable and movable therewith to a position between and behind the rims of the wheeled vehicle when the tires mounted upon the rims are in facial contact with said ramp faces and further rotatable and movable as required to bring said rim engaging member into rim engagement to attach said wheel blocks thereto and to prevent movement of the wheels in either direction.

4,399,894

PUSH ROD SLACK ADJUSTER

Leonard T. Tribe, Ann Arbor, Mich., assignor to Kelsey-Hayes Company, Romulus, Mich.

Continuation of Ser. No. 11,968, Feb. 14, 1979, abandoned. This application Aug. 18, 1981, Ser. No. 293,781
Int. Cl.³ F16D 65/56
U.S. Cl. 188—71.9 **19 Claims**



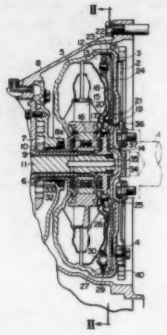
1. In a mechanically-actuated disc brake, including a rotor, rotatable about an axis, having a friction surface thereon, friction element means for frictionally engaging said rotor friction surface, a drive assembly including a rotatable helical cam member and an actuating member coaxially positioned within, and rotationally interlocked with, said rotatable cam member, an annular nonrotatable cam member in communication with said drive assembly, whereby upon rotation of said drive assembly, said nonrotatable cam member axially translates in a forward brake-applying direction, a push rod communicating with said friction element means, said push rod coaxially positioned within, and circumscribed by, said rotatable and nonrotatable cam members, an annular nut circumscribing and threadably engaging said push rod, said annular nut having a shank portion, coaxially positioned within said rotatable and nonrotatable cam members, and a radially-projecting flange communicating with said nonrotatable cam member, whereby said nonrotatable cam member urges the combination of said annular nut and push rod in said forward brake-applying direction in response to rotation of said drive assembly, thereby urging said friction element means into engagement with said rotor friction surface, means for biasing the combination of said annular nut and push rod in a rearward brake-releasing direction upon counter-rotation of said drive assembly, the improvement comprising adjusting means for rotating the annular nut relative to said push rod, thereby forwardly advancing said push rod with respect to said annular nut, said adjusting means including plate clutch means circumscribing, and projecting radially from, said annular nut and driven by said drive assembly, lost motion means, whereby said push rod is forwardly advanced with respect to said annular nut after a predetermined rotation of said drive assembly, and one-way brake means for frictionally resisting rearward retraction of said push rod with respect to said annular nut.

4,399,895

TORQUE CONVERTER LOCK UP CLUTCH ROTARY DAMPER WITH REINFORCING LIPS

Seitok Kubo, Toyota; Koujiro Kuramochi, Okazaki, and Tatsuo Kyushima, Toyota, all of Japan, assignors to Toyota Jidosha Kogyo Kabushiki Kaisha, Japan

Filed Nov. 25, 1980, Ser. No. 210,211
Claims priority, application Japan, Mar. 21, 1980, 55-37858
Int. Cl.³ F16D 3/66
U.S. Cl. 192—3.29 **4 Claims**



1. A rotary power transmission device, comprising:

(a) coaxial power input and power output shafts;

(b) a torque converter, comprising a front cover having an annular outer portion of an angular cross section and rotationally connected to said power input shaft, a pump impeller rotationally connected to said front cover, a turbine rotationally connected to said power output shaft, and a stator; circulation o fluid through said pump impeller, said turbine, and said stator transmitting rotary power from said power input shaft to said power output shaft, said torque converter having an annular space between said annular outer portion of said front cover and said turbine;

(c) a substantially disk shaped clutch assembly coaxial with said torque converter, said clutch assembly comprising said front cover as a first clutch plate element rotationally coupled to said power input shaft, and a second clutch plate element opposing said first clutch plate element;

(d) a rotary damper mounted so as rotationally to couple said second clutch plate element and said power output shaft with a certain amount of damped rotational play therebetween, comprising:

(d1) two outer mutually opposed damper plate elements and one inner damper plate element sandwiched between said outer damper plate elements, one of said outer damper plate elements being a substantially flat annulus and the other said outer damper plate element being substantially a flat disk; said outer damper plate elements being rotationally coupled together; said inner damper plate element being a flat annulus and formed with a plurality of circumferentially extending slot shaped apertures, and said outer damper plate elements being each formed with a plurality of generally circumferentially extending slot shaped apertures opposing said circumferentially extending slot shaped apertures in said inner damper plate element; and each of said slot shaped apertures in said outer damper plate elements being formed with a raised lip projecting from the general plane of its outer damper plate element in the direction away from said damper plate element, said raised lip being continuous all around the entire periphery of said slot shaped aperture; and

(d2) a plurality of compression coil springs, each lying within one of said slot shaped apertures in said inner damper plate element and extending generally therealong circumferentially to said inner damper plate element, with its sides projecting into those said slot shaped apertures in said outer damper plate elements which oppose said slot shaped aperture in said inner damper plate element;

(d3) an assembly of said two annular damper plate elements, a peripheral portion of said damper plate elements and said compression coil springs being positioned in said annular space of said torque converter;

(e) and a means for selectively biasing said first and second clutch plate elements towards and away from one another, so as to be engaged and disengaged from one another;

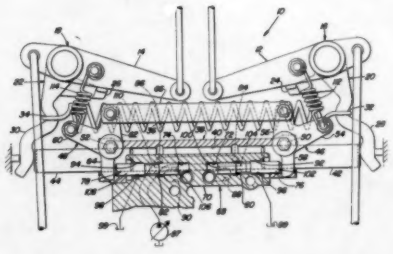
(f) whereby, when said outer damper plate elements rotate relative to said inner damper plate element, the ends of said compression coil springs in one rotational direction abut against the ends in that rotational direction of said circumferentially extending slot shaped apertures in said inner damper plate element, and the ends in the rotational direction opposed to said one rotational direction of said compression coil springs abut against the ends in said other rotational direction of the said circumferentially extending slot shaped apertures in said outer damper plate elements, said ends in said other rotational direction of said slot shaped apertures in said outer damper plate elements being reinforced by the portions of said raised lips which extend along said ends of said apertures, and the stiffness of the peripheries of said apertures in said outer damper plate elements being promoted by the provision of said raised lips, so that said compression coil springs are well able to withstand high centrifugal forces tending to urge them away from the rotational axis of said rotary damper, when said rotary power transmission device is transmitting power at high rotational speed.

4,399,896

STEERING BRAKE AND CLUTCH CONTROL

Wilbur D. Behlmer, Dubuque, Iowa, assignor to Deere & Company, Moline, Ill.

Filed Jun. 25, 1981, Ser. No. 277,419
Int. Cl.³ F16D 67/04
U.S. Cl. 192—13 R **5 Claims**



1. A steering brake and clutch control, comprising: first and second primary control levers respectively pivotally mounted for movement about first and second parallel axes between respective brake-release and brake-engage positions; first and second clutch control levers respectively pivotally mounted for movement about third and fourth parallel axes between respective clutch-engage and clutch-release positions; first and second valve means respectively operatively associated with the first and second clutch control levers and controlled by the latter so as to be respectively conditioned for routing pressure fluid for effecting clutch-engagement when the first and second clutch control levers are in their clutch-engage positions for draining clutch-engagement pressure when the first and second clutch control levers are in their clutch-release positions and for partially draining clutch-engagement pressure to

establish partial clutch-disengagement when the first and second control levers are in intermediate positions between their clutch-engage and clutch-release positions; interlocking means interconnecting the first and second clutch control levers for preventing simultaneous rotation of the latter from their respective clutch-engage to their respective clutch-release positions while permitting the first and second clutch control levers to be individually rotated; first and second yieldable connection means respectively interconnecting the first primary control lever and the first clutch control lever, and interconnecting the second primary control lever and the second clutch control lever; said first and second yieldable connection means being respectively located for causing the first and second clutch control levers to move toward their respective clutch-disengage positions when the first and second primary control levers are moved toward their respective brake-engage positions.

4,399,897

DIAPHRAGM CLUTCH MECHANISM

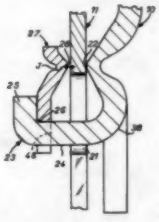
Rene Billet, Lamorlaye, and Michel Bacher, Garges-les-Gonesse, both of France, assignors to Valeo, Paris, France

Filed Jun. 18, 1980, Ser. No. 160,460

Claims priority, application France, Jun. 25, 1979, 79 16226

Int. Cl.³ F16D *13/36*

U.S. Cl. 192—89 B **15 Claims**



1. A diaphragm clutch cover assembly for a motor vehicle, of the kind comprising a generally annular cover member adapted to be peripherally attached to a reaction plate, and intended to be rotationally fast with a pressure plate; a diaphragm comprising a Belleville spring having a peripheral portion acting on the pressure plate and a central portion divided into radial fingers for cooperating with a clutch release bearing; and connection means fastening the diaphragm to the cover for rocking movement with respect thereto, said connection means comprising relatively thin, flat lugs extending from the cover, each having an axial portion and a radial portion, which portions define between them a bend, said axial portion having a circumferential extent substantially greater than its radial thickness, and a diaphragm support ring engaging said bend, the cover and the support ring defining, for the diaphragm, a primary fulcrum support and a secondary fulcrum support respectively which supports are disposed substantially opposite one another, there being play between the supports and the diaphragm, and the axial portion of the lugs having a thrust bearing surface against which the support ring is applied, while the radial portion of each lug is formed by a part of the lug which is folded radially outwardly of the plane of the axial portion of the lug about a chordal bend line parallel to the plane of the axial portion of the lug in such a manner as to clamp the support ring means between the said abutment surface and the bend.

4,399,898

DEVICE FOR RELEASABLY SECURING A SHAFT IN A HUB

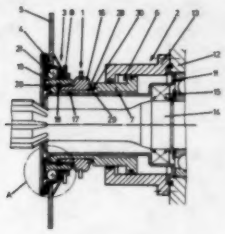
Armin Olschewski, Schweinfurt; Manfred Brandenstein, Eussenheim; Lothar Walter, and Heinrich Kunkel, both of Schweinfurt, all of Fed. Rep. of Germany, assignors to SKF Kugellagerfabriken GmbH, Schweinfurt, Fed. Rep. of Germany

Filed Nov. 4, 1980, Ser. No. 204,016

Claims priority, application Fed. Rep. of Germany, Nov. 6, 1979, 2944648

Int. Cl.³ F16D *24/14, 25/08;* F16B *21/07*

U.S. Cl. 192—98 **11 Claims**



1. In a device for securing a shaft in a hub, wherein the hub has an annular groove in its bore, an annular recess on the shaft radially faces the groove and has a radially directed shoulder, an adjusting member is axially moveable on the shaft in said recess, the adjusting member having a conical face directed toward the shoulder, whereby the shoulder and conical face define an adjustable recess that widens radially outwardly, and an elastic securing ring of round cross-section received in said groove and adjustable recess, the floor of the adjustable recess at the axial end thereof away from said shoulder being spaced from the bore of the hub a distance at least equal to the radial thickness of said securing ring; the improvement wherein said hub has a conical shoulder facing in the direction opposite to the axial adjustment of said adjusting member, said conical shoulder being immediately adjacent said annular groove, said conical shoulder having a smaller vertex angle than the vertex angle of the conical face of the adjusting member, and a spring member on said shaft for the automatic axial adjustment of said adjusting member, for urging said conical face of said adjusting member against said securing ring, said securing ring being positioned to contact said conical shoulder when said shaft is thrust axially into said hub in the assembly of said shaft therein.

4,399,899

CLUTCH RELEASE BEARINGS

Michael J. Breward, Hitchin, and Andrew M. F. Ritchie, Newport Pagnell, both of England, assignors to SKF Industrial Trading and Development Co. B.V., Nieuwegein, Netherlands

Division of Ser. No. 716,949, Aug. 23, 1976, Pat. No. 4,252,225, which is a continuation of Ser. No. 460,240, Apr. 11, 1974, abandoned. This application Nov. 21, 1980, Ser. No. 209,055

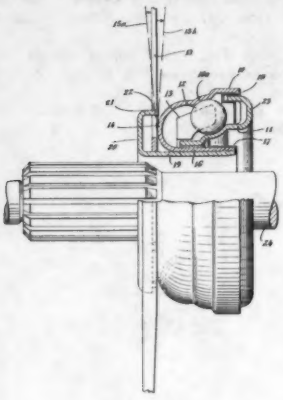
Claims priority, application United Kingdom, Apr. 13, 1973, 18037/73

Int. Cl.³ F16D *19/00*

U.S. Cl. 192—98 **1 Claim**

1. A clutch release bearing for attachment to a diaphragm spring declutching member, the bearing comprising an outer race and an inner race, an annular series of rolling elements which roll on the raceway of each race to transmit thrust therebetween, a first of said races having a radially extending shoulder for engagement with said diaphragm spring declutching member and a sleeve attached to said first race for rotation therewith about the axis of the clutch, which sleeve extends axially or connection with the side of said diaphragm spring declutching member remote from the bearing, the other of said

races having a radially extending shoulder for directly engaging a clutch operating member which is operable to move the bearing axially to engage and disengage the clutch, said shoulder on said first race being provided with a turned-over end portion to form a groove into which a suitably shaped inner



periphery of said diaphragm spring declutching member is engagable, said groove having a mouth facing radially outward, and said sleeve being provided with an outwardly turned flange connected to said turned-over end portion of said shoulder.

4,399,900

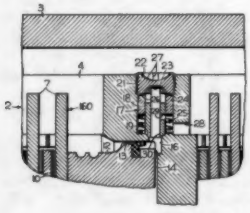
CENTRIFUGAL HYDRAULIC HEAD RELIEF VALVE

Gerardus M. Ballendux, Waukesha, and Robert E. Schott, New Berlin, both of Wis., assignors to Allis-Chalmers Corporation, Milwaukee, Wis.

Filed Dec. 22, 1980, Ser. No. 219,261

Int. Cl.³ F16D *25/063, 25/14*

U.S. Cl. 192—106 F **10 Claims**



1. A hydraulic clutch having a centrifugal head relief valve comprising, a friction clutch including a plurality of rotating friction disks forming a disk stack, a hydraulic actuator defining a hydraulic fluid pressurizing chamber for engaging said friction disks of said disk stack, a relief valve in communication with said pressurizing chamber, said relief valve including an annular clutch drum defining a radial valve supporting opening and a vent passage, relief passage means connecting said pressurizing chamber with said valve, a valve aligning means concentrically mounted in said valve supporting opening providing connecting passage means and a vent opening between said vent passage and said relief passage means, a movable valve element reciprocally mounted in said valve supporting opening slidably engaging said valve aligning means and defining an expansible fluid pressure chamber, a valve cover removably retaining said valve aligning means concentrically within said opening, resilient means normally biasing said movable valve element radially outward, a central opening communicating with said connecting passage means in the outer end of said valve aligning means for admitting pressurized fluid to said expansible fluid pressure chamber to bias said movable valve element radially inwardly of said clutch drum to close said relief valve when fluid is pressurized in said pressurizing chamber and the clutch is engaged, said valve aligning means defining said vent opening extending to communicate with said vent passage in said clutch drum for release of fluid from said pressurizing chamber when said clutch is released.

4,399,901

STROKE SELF-ADJUSTING MECHANISM FOR A CONTROL CABLE

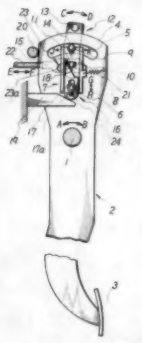
Tetuo Kobayashi, Ikeda, and Noboru Hagiwara, Nishinomiya, both of Japan, assignors to Nippon Cable System Inc., Hyogo, Japan

Filed Apr. 9, 1981, Ser. No. 252,285

Claims priority, application Japan, Sep. 10, 1980, 55-129404[U]

Int. Cl.³ F16D *13/75*

U.S. Cl. 192—111 A **7 Claims**



1. A stroke self-adjusting mechanism for a control cable comprising

a lever pivotally connected to a shaft and provided with both a first lock surface having a circular arc shape at one end thereof and a second lock surface which has a circular arc shape and which positions below and is almost concentric with the first lock surface;

a fixed pin provided at a center area of radius in said first and second lock surfaces;

a guide plate pivotally connected to said fixed pin at one end thereof and having a laterally extending hole;

an adjusting lever having a movable pin at one end thereof and having a first locking pin and a second locking pin at the other end thereof, said movable pin being slidably engaged with said laterally extending hole, said first and second locking pins being contacted with and being pressed against said first and second lock surfaces respectively when the lever is rotated, and the second locking pin being engaged with a notch provided at the guide plate;

a lock-releasing plate having vertically extending hole at one end thereof and having a lock-releasing pawl at the other end thereof, the lock-releasing plate being pivotally connected to said fixed pin by the vertically extending hole to move slidably within the guide plate;

a lock-releasing stopper being capable of contacting with the lock-releasing plate; and

an end fitting pivotally connected to said adjusting lever through said movable pin, an inner cable of the control cable being connected to the end fitting at one end thereof,

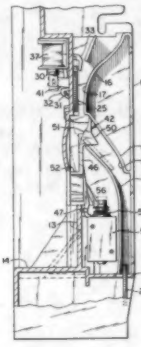
whereby a working device which is connected to the other end of the inner cable being remotely controlled, and an expansion or a contraction of said inner cable being able to automatically adjust.

4,399,902

COIN-HANDLING ESCROW ASSEMBLY

Charles R. Holland, and Carl L. Vogt, both of St. Louis, Mo., assignors to Coin Acceptors, Inc., St. Louis, Mo.

Filed Sep. 10, 1980, Ser. No. 185,753
Int. Cl.³ G07F 9/04
U.S. Cl. 194—1 D **6 Claims**



1. A coin-handling assembly, comprising:
(a) a coin escrow station for receiving coins of one denomination,
(b) escrow-actuating means selectively retaining the coins in the escrow station, and selectively releasing the coins individually from the escrow station,
(c) a coin return means for returning the coins,
(d) a cash box means for accepting the coins,
(e) a coin-diverting means selectively engaging each coin when released from the escrow station, and selectively directing each coin to either the coin return means or the cash box means,
(f) the escrow station including means for supporting the coins in successive adjacency, and for delivering the coins to the coin-diverting means when released by the coin escrow actuating means, and
(g) the escrow-actuating means including:
1. first and second fingers selectively movable into and out of the path of the coins in the escrow station, and
2. actuator means selectively moving the first finger into engagement with a lowermost coin, and the second finger out of engagement with the coins for holding the coins in the escrow station, and the actuator means selectively moving the first finger out of engagement with the lowermost coin for releasing the lowermost coin for delivery to the coin-diverting means, and selectively moving the second finger into engagement with a next adjacent coin for holding the coins in the escrow station while the first finger releases the said lowermost coin.

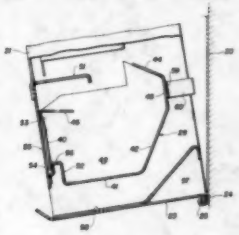
4,399,903

ENLARGED COIN BOX FOR PRODUCT DISPENSER

Winford G. McDonald, 128 Hill, Center, Tex. 75935

Continuation-in-part of Ser. No. 210,224, Nov. 25, 1980, Pat. No. 4,363,392. This application Dec. 15, 1981, Ser. No. 330,951
Int. Cl.³ G07F 9/06
U.S. Cl. 194—1 F **9 Claims**

1. In a product dispenser having an upper cabinet body for the storage of product units in one or more columns, a coin mechanism operable to release product units following insertion of proper coins into the mechanism, a bottom product outlet chamber adapted to contain a cash box, the improvement comprising a cash box of enlarged capacity within said chamber above the floor of the chamber and forwardly of the rear wall of the chamber and below a passageway in the dispenser through which deposited coins fall into the cash box, the cash box having a rear wall near and forwardly of the rear wall of said chamber and having a forward wall including a spring portion biased forwardly of the plane occupied by the



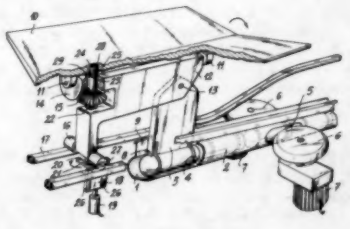
forward wall of the cash box when in a relaxed state, a bracket element fixed to the rear wall of the cash box and positively engaging said rear wall of the chamber when the dispenser is in an upright use position, said bracket element then forcing the cash box forwardly in said chamber and causing said biased spring portion to engage a front wall of the chamber and yield so as to lie substantially in the plane occupied by the front wall of the cash box with the latter disposed flat against the front wall of the chamber, thereby firmly positioning the cash box in the chamber by spring pressure, and additional weight supporting means for the cash box within the chamber.

4,399,904

SORTING AND/OR CONVEYING SYSTEM AND RELEVANT WORKING PLANTS

Francesco Canziani, San Macario, Italy, assignor to C.M.L. Costruzioni Meccaniche Lonatesi, S.p.A., San Macario, Italy

Filed Jan. 21, 1981, Ser. No. 226,602
Claims priority, application Italy, Apr. 16, 1980, 21397 A/80
Int. Cl.³ B63G 47/38
U.S. Cl. 198—365 **4 Claims**



1. A sorting and conveying system comprising:
(a) a plurality of tiltable carriages fixed on supports mounted on separate slidable spindles;
(b) a substantially tubular guide provided with a continuous longitudinal slot through which said carriage supports extend; and
(c) a plurality of openings spaced along said tubular guide through which driving means for the sliding movement of said spindles extend,
said carriages consisting of tiltable plates which may rotate about said supports, each having a pin turning on

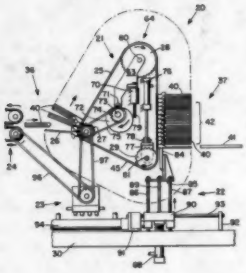
the inside of said support, actioned by a cam inserted at a desired point along the path of travel, onto said pin there being keyed a level pinion which, when the pin is turned by the action of said cam, engages a gear on said plate, causing the tilting thereof.

4,399,905

APPARATUS FOR ALTERNATELY FORMING AND FORWARDING STACKS OF ARTICLES

William A. Lance, Cincinnati, and Alfred H. Abbott, Franklin, both of Ohio, assignors to The Procter & Gamble Company, Cincinnati, Ohio

Filed Jul. 2, 1981, Ser. No. 279,912
Int. Cl.³ B65G *47/26*
U.S. Cl. 198—422 **4 Claims**



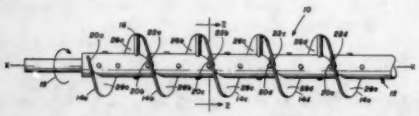
1. An improved apparatus for alternately forming a predetermined stack of articles in vertically spaced ways, and then removing the stack as a unit from between said ways, said apparatus including a frame, an endless flight of said ways looped about a plurality of guide members to define a closed path which path passes through an infeed station and an outfeed station, stack removal means, unitary flight drive means, and means for operating said flight drive means in timed relation with an ancillary article infeed means so that a said article is received between each two adjacent said ways at said infeed station, said improvement comprising means for cyclically spatially stopping and forwarding a portion of said flight of ways adjacent said outfeed station while continuously operating said unitary flight drive means to continuously forward said flight of ways through said infeed station and past all of said guide members, and means for operating said stack removal means in timed relation with said cyclically stopping so that each time a said stack of articles arrives at said outfeed station, said stack is forwarded from said ways to an ancillary receiving means while said stack has been spatially stopped.

4,399,906

TEMPERATURE EXPANSIVE SCREW CONVEYOR

Cecil E. Millsap, Burleson, Tex., assignor to Thomas Conveyor Company, Inc., Fort Worth, Tex.

Filed Jan. 22, 1981, Ser. No. 227,253
Int. Cl.³ B65G *33/26*
U.S. Cl. 198—662 **14 Claims**



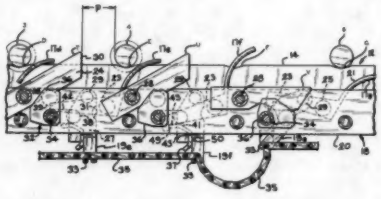
1. A screw conveyor for conveying material comprising:
shaft means mounted for rotation about an axis and having holes formed therein, each of said holes being positioned at a predetermined angle from the next adjacent hole;
a plurality of stake means slidably inserted in said holes and extending generally outward from said shaft means;
a plurality of adjacent flights having a trailing edge and a leading edge with a continuous helical contour therebetween positioned about a portion of said shaft means for conveying material as said shaft means is rotated, the trailing edge of each of said flights slideably overlapping the leading edge of the adjacent one of said flights, each of said flights secured to selected ones of said stake means so that each of said flights and said selected ones of said stake means can move relative to said shaft means during expansion and contraction of the screw conveyor.

4,399,907

ACCUMULATING CONVEYOR

Douglas D. Wiknich, and Michael J. Peabody, both of Troy, Mich., assignors to LaSalle Machine Tool, Inc., Troy, Mich.

Filed Apr. 6, 1981, Ser. No. 251,066
Int. Cl.³ B65G *25/10*
U.S. Cl. 198—718 **15 Claims**



15. A shuttle type accumulating conveyor comprising an elongated generally horizontal support along which a plurality of articles are movable through a series of longitudinally spaced-apart stations, a transfer bar mounted for movement forwardly and rearwardly longitudinally along said elongated support, a plurality of feed units on said transfer bar movable between idle and feed positions, drive means for moving said transfer bar back and forth through a work cycle for moving all articles situated behind an empty station to their next adjacent stations, said work cycle including a forward stroke wherein said transfer bar moves forwardly a predetermined distance which is substantially greater than the distance between stations and a return stroke wherein said feed units are returned to their idle positions, means including a plurality of actuator assemblies positioned in the path of movement of said feed units during the return stroke of said transfer bar for moving said feed units from said idle positions to said feed positions, said actuator assemblies being mounted at said stations for movement between an operative position, an inoperative position and an advanced position, a chain member connecting adjacent actuator assemblies, sensing means at each station for sensing the absence of an article, each of said sensing means being operatively associated with a corresponding actuator assembly so that at an empty station said sensing means causes said actuator assembly to be maintained in its operative position, said chain member being provided to maintain all actuator members in operative positions behind a first member maintained in the operative position so that when said transfer bar is moved fully rearwardly all actuator assemblies held in operative positions provide for movement of all corresponding feed units to feed positions, and means on each of said actuator assemblies enabling unobstructed movement of said transfer bar through said entire forward stroke in which said transfer bar is moved said predetermined distance.

4,399,908

STRUCTURAL ELEMENT

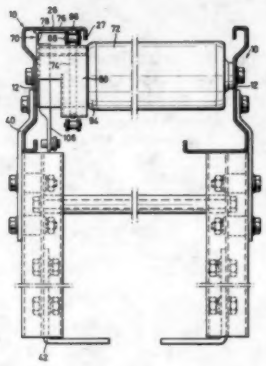
Rolf Gunti, Laufen, Switzerland, assignor to Masyc AG, Munchenstein, Switzerland

Filed Apr. 19, 1978, Ser. No. 897,706

Claims priority, application Switzerland, Apr. 19, 1977, 4839/77

Int. Cl.³ B65G *13/06*

U.S. Cl. 198—789 **8 Claims**



1. A set of structural elements for producing longitudinally extending support frames for conveying devices, said support frames being disposed parallel to the conveying direction and on opposed sides of the conveyor path, said conveying devices including a cylindrical roller having a central spindle and a pinion at one end thereof, said roller being driven by a chain entrained around said pinion, said set of structural elements comprising:

a plurality of detachably connected sectional bars, each said sectional bar including a middle web member (**12**) having openings (**14**) at regular intervals therealong, and adjoined on both sides in the outward direction by sloping web members, bent at a defined angle, the ends of which merge with a connecting member (**20, 22**) which is parallel with the middle web member and is associated with U-section flanges which face each other, with one U-section flange (**20**) having a broad U-web member (**16**), the latter together with the middle web member being dimensioned for maximum torsion and bending load values for said sectional bars, and with the other U-section flange (**22**) having its outside free member (**30**) situated in the region of the plane containing the inwardly oriented surface of the middle web member; and

a chain guide member having first and second angled plate members (**78, 76**) disposed in perpendicular relationship, said first angled plate member (**78**) including a central aperture for receiving said central spindle of said roller, said chain guide member further including a pair of guard caps formed integrally with said first angled plate member and projecting perpendicularly outwardly therefrom towards said roller, said guard caps being spaced from said second angled plate member (**76**) thereby defining a chain receiving channel, said guard caps being configured to extend over and be spaced from a portion of the circumference of the pinion of said roller, and with said second angled plate member further including a guide rail for urging said chain, disposed within said chain receiving channel, into driving engagement with said pinion, and with said first angled plate member further including a pair of anchor cams (**84**), projecting outwardly therefrom, opposed to said guard caps, said anchor cams being receivable in said openings (**14**) formed in said middle web member (**12**) when said guide member is mounted on said sectional bar with said first angled plate member (**78**) being in face to face contacting relationship with said inner surface of said middle web member (**12**) and with said second angled plate member (**76**) being disposed parallel and adjacent to said broad U-web member (**26**), said broad U-web member thereby shielding said second angled plate member (**76**), and whereby said anchor cams (**84**) are operative to prevent the rotation of said chain guide member relative to said sectional bar.

4,399,909

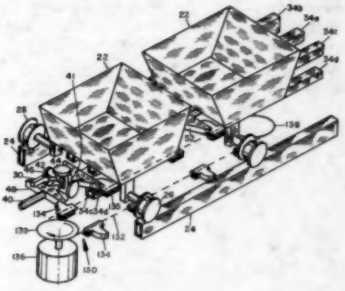
CHAIN FOR A TROLLEY CONVEYOR SYSTEM

Roman Gorelik, 1150 S. Glencoe, Denver, Colo. 80222

Filed Nov. 26, 1980, Ser. No. 210,273

Int. Cl.³ B65G *17/38*

U.S. Cl. 198—852 **17 Claims**



14. An endless chain adapted for three-dimensional movement along a predetermined path comprising, in combination:

a plurality of elongated arms and connecting members, said connecting members including a frame having an opening therein and positioned so at least to be partially enclosed by a chain rail assembly having four separate rails, each of said rails being parallel to the other rails, one of said arms leading each connecting member and another of said arms trailing each connecting member, each of said connecting members operably connected to the rearward end of a leading arm and the forward end of a trailing arm, said connecting member including a first guide means having a first pair of wheels with an axis of rotation coaxial with an X axis, said first pair of wheels being rotatably mounted on a pair of stub axles extending integrally away from said frame, one of said leading and trailing arms being universally connected to said connecting member and the other of said leading and trailing arms being pivotably connected to said connecting member, said connecting members further including second guide means having a pair of wheels with an axis of rotation coaxial with a Y axis, said second pair of wheels being rotatably mounted on an axle, said Y axis being perpendicular to and intersecting said X axis.

4,399,910

JEWELRY RETAINING MEANS INCLUDING COMPENSATION MEANS FOR DIMENSIONAL VARIATIONS IN OBJECTS RETAINED THEREIN

Charles Gutentag, Los Angeles, Calif., assignor to Tempo G, Los Angeles, Calif.

Filed Dec. 8, 1981, Ser. No. 328,722

Int. Cl.³ B32B *3/10*

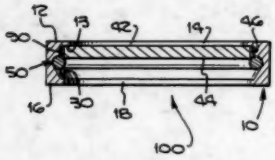
U.S. Cl. 206—0.82 **11 Claims**

1. An improved frame for holding and retaining an object, wherein the improved frame is characterized by an upper portion and a lower portion, the upper portion containing an upper face having a central hole for exposing the upper surface

of the object, the lower portion containing a lower face having a large central hole, wherein the object is held in the frame's upper portion so that the upper face of the object shows through the opening in the upper surface of the frame and wherein the object is retained in place by means of an open ended resilient prestressed retaining wire having a round cross-section which exerts a centrifugal force when inserted into a groove which extends along the entire inner circumferential wall along the lower portion of the frame such that the uppermost portion of the groove is adjacent the upper portion of the frame and also adjacent the lower surface of the retained object and the lowermost portion of the groove is adjacent the lower face of the frame, whereby a vertical force component from the open ended prestressed retaining wire having a round cross-section against the lower surface at or near the perimeter area of the object serves to retain the object in place and a horizontal force component from the retaining wire serves to retain the wire within the groove in the lower portion of the inner frame wall, wherein the improvement comprises:

a. said groove having a cross-sectional height substantially greater than the diameter of said open ended resilient prestressed retaining wire;

b. said groove having a smooth side wall which is tapered



along the cross-sectional height of the groove wherein the groove is at a uniform angle such that it becomes progressively deeper along its tapered portion and such that its deepest point is adjacent its uppermost portion;

c. the lower wall edge of said groove furthest removed from the retained object being substantially straight and substantially parallel to the lower surface of the object being retained, an extending for a length at least approximately equal to 10 percent of the diameter of said open ended resilient prestressed retaining wire; and

d. said open ended resilient prestressed retaining wire being presized such that its open ends will abut when the retaining wire is compressed to the point where forced against said lower wall edge of said groove;

e. whereby the geometry of said groove will automatically permit said open ended resilient prestressed retaining wire to simultaneously vector a portion of the spring preload against the object while another vector portion of the spring preload will serve to secure the retaining wire within the groove, thereby enabling one standard size frame to accommodate similarly shaped objects within a range of differing thicknesses and assuring that the object will remain inside the frame even if substantial force is applied to the upper surface of the object.

4,399,911

CARTRIDGE FOR USE IN ANCHOR BOLTING

John M. Murphy, Mansfield; Robert H. Spensley, Swanwick, and John Ellis, Sutton in Ashfield, all of England, assignors to Societe Anonyme d'Explosifs et de Produits Chimiques, Paris, France

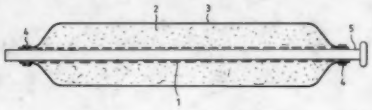
Filed Jun. 25, 1981, Ser. No. 277,345

Claims priority, application United Kingdom, Jul. 23, 1980, 8024030

Int. Cl.³ B65D *25/08*

U.S. Cl. 206—219 **6 Claims**

1. An anchoring cartridge for use in anchoring a reinforcing or fixing element in a borehole in a substrate, the cartridge comprising a frangible liquid-impermeable casing containing a particulate liquid-settable solid component through which passes a longitudinally extending discontinuous tube having at least one open end portion thereof located at one end of the cartridge so as to be in communication with the exterior, whereby when the cartridge, or at least said one end of the



cartridge, is immersed in an activating liquid component capable of reacting with the solid component so as to cause it to set, the liquid is caused to enter the discontinuous tube within the cartridge and to come into contact with the solid component over substantially its whole length within the casing.

4,399,912

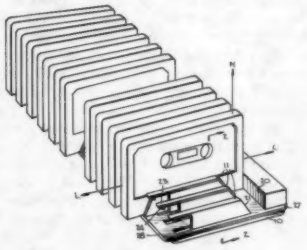
TAPE CASSETTE HOLDER

Alfred Mollen, Richmond, Va., and Zelman Levine, Minneapolis, Minn., assignors to Patent Investment Associates, Richmond, Va.

Filed Apr. 24, 1981, Ser. No. 257,169

Int. Cl.³ B65D *85/67*

U.S. Cl. 206—387 **3 Claims**

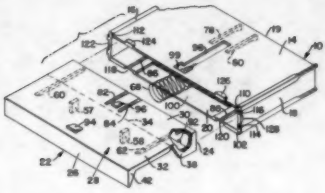


1. A tape cassette holder comprising a base; a plurality of substantially parallel partitioning members projecting from the base, said partitioning members defining therebetween a plurality of channels dimensioned to slideably engage in the lengthwise direction only the trapezoidal enlargements of a tape cassette and being adapted and positioned on said base so that each channel shares at least one partitioning member with an adjacent channel; a backstopping means for limiting the path of travel of the tape cassette in the channels defined by said partitioning members and a resilient locking means on at least one of the partitioning members defining each channel, said resilient locking means being adapted to engage the top edge of the trapezoidal enlargement of a tape cassette and to resiliently deflect in an upward direction from said top edge as a tape cassette is inserted into the channel and to resiliently return to a position of overlapping engagement with the corner of the top edge of said trapezoidal enlargement when the tape cassette is fully inserted.

4,399,913
CASSETTE CONTAINER WITH FLEXIBLE AND HINGED DRAWERS

Anthony L. Gelardi; Paul J. Gelardi, both of Cape Porpoise, and Robert B. MacLeod, Jr., Biddeford, all of Me., assignors to Shape Inc., Biddeford, Me.

Filed May 18, 1981, Ser. No. 264,948
Int. Cl.³ A47B *88/00*; B65D *85/672*
U.S. Cl. 206—387 **66 Claims**



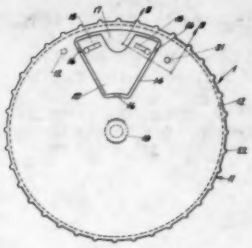
1. A container for holding a cassette comprising:
(a) a rectangular casing having top, bottom and side walls, a rear wall and an open front;
(b) a drawer for holding a cassette, said drawer being reciprocally received in the casing and slidable between a cassette-storing position within the casing and a cassette-exposing position partially-extended outwardly from the casing and said drawer comprising rear walls, and a front wall and a bottom wall having a forward portion extending outwardly from the casing when the drawer is moved to its cassette-exposing position;
(c) spring means for biasing the drawer toward the cassette-exposing position;
(d) locking means for retaining the drawer in the cassette-storing position including a projection formed on the outer surface of the drawer bottom wall near the forward end thereof and a recess formed in the inner surface of the casing bottom wall near the front portion thereof for receiving the locking projection of the drawer when the drawer is in the cassette-storing position and wherein the drawer is releasingly disengaged from the cassette-storing locked position by exerting a slightly inward and upward pressure against the drawer; and
(e) stop means for limiting movement of the drawer to the cassette-exposing position including a projection formed on the outer surface of the drawer bottom wall near the rear end thereof, said stop projection moveable in the recess formed in said casing bottom wall until engagement with the front edge thereof for limiting further outward movement of the drawer from the casing; and
wherein the locking projection has a width greater than the stop projection and wherein the recess formed in the casing bottom wall has a T-shape configuration with the front edge thereof of a width approximately the same as the locking projection width for providing a positive locking action therebetween.

4,399,914
PILFER RESISTANT CONTAINER

Harold Damratowski, Alda, and Jerry Jenson, Grand Island, both of Nebr., assignors to Triad Corporation, Alda, Nebr.

Filed Apr. 16, 1982, Ser. No. 369,091
Int. Cl.³ B65D *83/04*
U.S. Cl. 206—533 **10 Claims**

1. A generally cylindrical container having a body portion including a plurality of cavity sections defined by radially extending walls and a lid portion rotatably secured to the body portion and containing an opening therein for accessing each section in turn as the lid portion is rotated with respect to the body portion, a removable tab closing said opening, said tab including means cooperating with said body portion to prevent

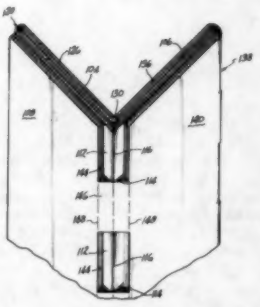


rotation of the lid until the tab has been removed, thereby defeating pilferage of the contents.

4,399,915
MACHINE FOLDABLE CORNER POST

John F. Sorenson, St. Paul, Minn., assignor to Champion International Corporation, Stamford, Conn.

Filed Oct. 15, 1981, Ser. No. 311,799
Int. Cl.³ B65D *81/02*
U.S. Cl. 206—586 **7 Claims**



1. A blank of corrugated paperboard material adapted to be folded into a multi ply corner post, said blank comprising:
(a) a first edge flap;
(b) a first panel adjacent to said first edge flap and foldably connected thereto by means of a first folding zone comprising a series of alternating straps and cut out holes;
(c) a second panel adjacent to said first panel and foldably connected thereto by means of a first fold line;
(d) a third panel adjacent to said second panel and foldably connected thereto by means of a second folding zone, said second folding zone comprising a series of alternating straps and cut out holes, with the straps in said second folding zone being aligned with the cut out holes in said first folding zone, and with the cut out holes in said second folding zone being aligned with the straps in said first folding zone, said straps in said second folding zone each being bisected by a fold line extending between mid planes of said cut out holes in said second folding zone;
(e) a fourth panel adjacent to said third panel and foldably connected thereto by means of a second fold line; and
(f) a second edge flap adjacent to said fourth panel and foldably connected thereto by means of a third folding zone, said third folding zone comprising a series of alternating straps and cut out holes, said straps in said third folding zone being aligned with said cut out holes in said first folding zone, and said cut out holes in said third

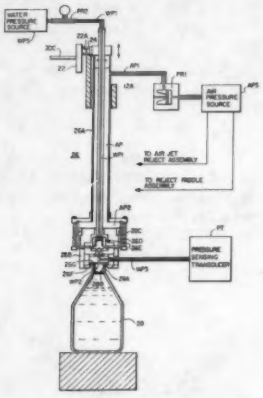
folding zone being aligned with said straps in said first folding zone.

4,399,916

REJECT SYSTEM FOR IN-LINE PRESSURE TESTING SYSTEM

Simon J. Richter, Marietta, Ga., and Michael Sanscharowskiy, Horseheads, N.Y., assignors to The Coca-Cola Company, Atlanta, Ga.

Division of Ser. No. 973,918, Dec. 8, 1978, Pat. No. 4,291,573.
This application Oct. 29, 1980, Ser. No. 201,831
Int. Cl.³ B07C 5/00
U.S. Cl. 209—559 2 Claims



1. The method of testing and rejecting unacceptable ones of a plurality of articles, said unacceptable articles being characterized on occasion by associated debris, comprising:

continuously conveying a plurality of articles in a timed sequence and at a known spacing sequentially past a test position and a downstream reject position;

applying a test parameter to each of said articles to determine its acceptability, while said article is moving through said test position;

sensing an unacceptable article at said test position by monitoring said test parameter;

storing the fact of an unacceptable article for a time period sufficient to permit that article to reach said downstream reject position; and

applying a rejecting force across the space occupied by said unacceptable articles over a time interval commensurate with the time it takes for the space between said unacceptable article and the next adjacent article in said sequence to pass by said downstream reject position to thereby remove said unacceptable article and any associated debris in that space from said sequence.

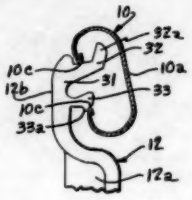
4,399,917

DUAL CURTAIN ROD ASSEMBLY

Thor Ohman, Madison, Wis., assignor to Graber Industries, Inc., Middleton, Wis.

Filed Jun. 11, 1981, Ser. No. 272,529
Int. Cl.³ A47F 5/08
U.S. Cl. 211—87 13 Claims

1. A curtain rod assembly for use in wide pocket curtains and the like comprising, upper and lower curtain rods each having a generally C-shaped cross section with spaced rod edges defining a slot at the rear side thereof, first and second mounting bracket means each including upper and lower rod engaging supports for detachably engaging the respective upper and lower curtain rods adjacent their ends to support the ends of the rods in vertically spaced relation, and at least one intermediate spacer bar dimensioned to extend between the upper and lower curtain rods and having upper and lower rod engaging means at opposite ends for engaging the upper and lower rods to interconnect the vertically spaced rods intermediate their ends, said upper and lower rod engaging means each including a rear body portion adapted to overlie the slot at the rear of the respective rod and first and second vertically spaced finger portions extending forwardly from the rear body portion and



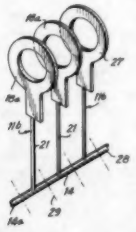
adapted to project through the slot in the rod and engage the rod edges along opposite sides of the slot, the first and second finger portions each having a lateral protrusion thereon spaced from the body portion for engagement with the rod internally thereof, said upper and lower rod engaging means each being constructed and arranged so that at least one of said first and second fingers is resiliently deformable relative to the other to allow the lateral protrusion thereon to snap over the edge of the rod.

4,399,918

TAG PIN DEVICES

Stanley Clements, Orangeburg, N.Y., assignor to Ben Clements & Sons, Inc., South Hackensack, N.J.

Filed Mar. 2, 1981, Ser. No. 239,701
Int. Cl.³ A47F 5/08
U.S. Cl. 211—113 5 Claims

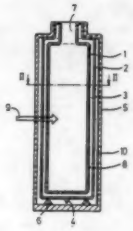


1. A Pegboard attachment for supporting a lightweight article on a peg of a Pegboard, said attachment comprising an essentially planar annulus having a central opening dimensioned for receipt of a peg therethrough, an arm extending generally radially from said annulus and in the same plane therewith, and a crossbar at the outer end of said arm, said crossbar with said arm having the shape of a T, means joining said attachment with at least one other such Pegboard attachment in the region of said crossbar into an assembly of attachments, said annulus, said arm, said crossbar and said joining means being intergrally formed of molded resin, said crossbars in joined state lying in a continuous line.

4,399,919
VACUUM FLASK

Mario Posnansky, Melchenbühlweg 18, 3006 Bern (Canton of Bern), and Urs Utiger, Oberönz, both of Switzerland, assignors to Mario Posnansky, Berne, Switzerland

Filed Feb. 17, 1978, Ser. No. 878,736
Claims priority, application Switzerland, Feb. 23, 1977, 2216/77; Fed. Rep. of Germany, Jun. 22, 1977, 2728050
The portion of the term of this patent subsequent to Apr. 8, 1997, has been disclaimed.
Int. Cl.³ A47J 41/02
U.S. Cl. 215—13 R 5 Claims

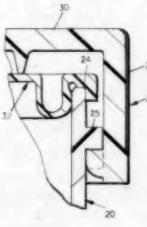


1. A vacuum flask comprising a vessel having an inner glass wall and an outer glass wall together bounding a substantially evacuated space and a protective jacket for enclosing said vessel, wherein a layer of a substance having a coefficient of absorption of at least 0.8 for short-wave light and a coefficient of emission not exceeding 0.1 for long-wave radiation is disposed on the surface of said inner wall facing said space.

4,399,920
CHILD RESISTANT PACKAGE

Peter T. Swartzbaugh, Toledo, and Paul W. Harbauer, Perrysburg, both of Ohio, assignors to Owens-Illinois, Inc., Toledo, Ohio

Filed Mar. 11, 1982, Ser. No. 356,996
Int. Cl.³ B65D 55/02
U.S. Cl. 215—211 8 Claims

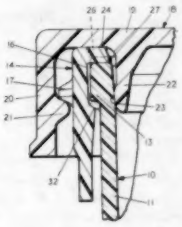


1. A child resistant package comprising
an open-mouth container having a plurality of circumferentially spaced projections extending radially outwardly adjacent the open end thereof,
each said projection having a shoulder facing downwardly in one circumferential direction,
a closure having a top panel and an annular skirt depending from the periphery of the top panel,
a plurality of radially inwardly extending and circumferentially spaced locking lugs on the inner surface of said skirt,
said locking lugs being adapted to engage the shoulders in the projections on the container,
said closure having means for sealingly engaging the open end of the container and extending downwardly into sealing engagement with the inner surface of the upper open end of the container,
said closure having at least one cam lug positioned on the inner surface of said skirt such that it is positioned between projections when the closure is on the container and the locking lugs are in engagement with said projections,
said cam lug having an inclined surface operable by engagement with a projection when an axial force is applied to the closure and the closure is rotated in a direction to disengage the locking lugs from the shoulders to engage a projection so that continued rotation of the closure will cam the closure axially upwardly disengaging the closure from the container.

4,399,921
CHILD RESISTANT CLOSURE AND CONTAINER

Maximillian Kusz, Waterville, Ohio, assignor to Owens-Illinois, Inc., Toledo, Ohio

Filed Apr. 9, 1982, Ser. No. 366,795
Int. Cl.³ B65D 55/02
U.S. Cl. 215—218 11 Claims



1. A child resistant closure and container comprising
a container,
a finish fitment rotatably mounted on the open end of the container,
first interengaging means between the finish fitment and the container permitting rotation of the fitment and container,
a closure having a top wall and a skirt,
second interengaging means between the finish fitment and the skirt requiring relative rotation to disengage the closure from the finish fitment,
said finish fitment including a top portion interposed between the top wall of the closure and the container such that the top wall of the container engages the portion of the fitment element,
said fitment element and said closure being rotatable relative to said container and said second interengaging means being disengageable only when said fitment element is manually grasped and prevented from rotating relative to said container,
and third interengaging means between the fitment and container such that relative rotation between the fitment and container is prevented during application of the closure,
and means for grasping the fitment to prevent rotation during removal of the closure.

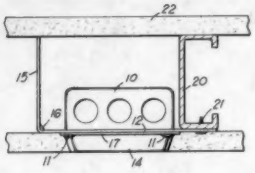
4,399,922
OUTLET BOX MOUNTING

Larry Horsley, 6320 Ravenwood Dr., Lithia Springs, Ga. 30057

Filed Sep. 14, 1981, Ser. No. 302,045
Int. Cl.³ H02G 3/08
U.S. Cl. 220—3.6 2 Claims

1. An outlet box mounting comprising an L-shaped mounting bracket formed from a unitary section of stiff sheet material, said mounting bracket including a flat plate body portion having a relatively large central opening of a size and shape to

register substantially with the interior chamber of an outlet box, said plate body portion having at least a pair of screw head clearance openings formed therethrough and said clearance openings being disposed on a diagonal axis across the relatively large central opening, said mounting bracket further including a right angular stabilizing rectangular plate extension including a straight edge spaced from and parallel to the plate body portion and adapted to engage an opposing wall surface during use, the stabilizing plate extension being disposed at one end of the plate body portion, the plate body portion of the L-shaped mounting bracket also having a pair of spaced bracket mounting openings formed therethrough near the edge of the plate body portion remote from said right angular stabilizing plate extension, whereby the mounting bracket can be attached to a wall stud by means of fasteners placed through said bracket mounting openings, an outlet box having at least a



pair of diagonally spaced mounting screws threadedly connected therewith and adapted to register with and pass through said pair of screw head clearance openings of the plate body portion with the outlet box having its open side in abutment with the rear face of the plate body portion, and a dry wall ring positioned on the forward face of the plate body portion of the L-shaped mounting bracket and having at least a pair of diagonally spaced slots which open through marginal edges of the dry wall ring, and said slots being sized to receive the shanks of the diagonally spaced mounting screws and being sufficiently narrow to prevent the heads of such screws from passing through said slots, whereby the dry wall ring through said slots can be engaged with said mounting screws loosely and rotated to a proper position of use in alignment with said outlet box and then secured by the tightening of said mounting screws.

4,399,923

TANK BOTTOM SHIELD

August Milo, 478 Schiller St., Elizabeth, N.J. 07206

Continuation-in-part of Ser. No. 275,807, Jun. 22, 1981. This application Oct. 5, 1981, Ser. No. 308,141

Int. Cl.³ B65D *90/48*

U.S. Cl. 220—85 R **7 Claims**

1. In a shield for protecting a portion of the bottom of a liquid storage tank which underlies the bottom of a cylindrical fill drop tube having a hollow interior defined by sidewalls through which a gauge stick is dropped to measure the liquid level of the tank contents and wherein the bottom of the drop tube defines a space above the tank bottom, the improvement which comprises

a combination shielding means and positioning means to interpose a protector between the bottom of the gauge stick and the bottom of the tank,

said shielding means comprising a circular baseplate of slightly smaller diameter than the diameter of the drop tube, the baseplate being adapted to be vertically moved within the fill drop tube, the positioning means being permanently affixed to the shielding means and being in sliding engagement within the fill drop tube,

said positioning means comprising at least three legs of length greater than the space between the bottom of the tank and the bottom of the fill drop tube, the legs being adopted to position the baseplate in registry below the fill drop tube, the legs each having a first end and a second end, the respective first ends being connected to the baseplate and the respective second ends being in sliding contact and engagement within the interior of the fill drop tube,

the said second ends of the legs being biased outwardly of the baseplate, the second ends frictionally engaging the sidewalls within the said hollow interior; and

a tie bar interconnecting at least two legs in spaced relation above the baseplate whereby the two connected legs act as a unit to engage simultaneously the interior of the drop tube.

4,399,924

CAP

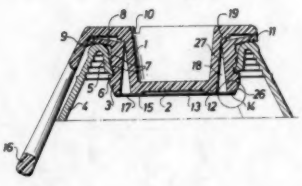
Erling I. Nilsson, Trastvägen, Sweden, assignor to Tetra Pak Developpement SA, Pully-Lausanne, Switzerland

Filed Aug. 25, 1981, Ser. No. 296,215

Claims priority, application Sweden, Aug. 26, 1980, 8005957

Int. Cl.³ B65D *51/20, 51/22*

U.S. Cl. 220—257 **13 Claims**



1. A closure for the mouth of a container comprising:

an outer body having a central opening forming a pouring channel, said outer body including first sealing means for engaging and sealing said outer body in the mouth of a container, said outer body having an annular surface at one end thereof;

an inner body adapted to be received within the central opening of said outer body, said inner body having an annular surface at one end thereof, the respective annular surfaces of said outer and inner bodies being substantially aligned;

a gas-tight disc extending across said annular surfaces of said outer body and said inner body; and

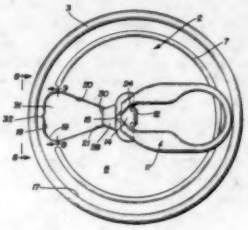
second sealing means for sealing said annular surfaces to said disc, said disc having a coating on the side opposite said annular surfaces whereby when said closure is inserted in a container, said disc prevents gas from escaping through said closure and said disc does not come in contact with the contents of said container.

4,399,925

POURING SPOUT STEEL CAN END CONSTRUCTION

Danny L. Fundom, Massillon, Ohio, assignor to Van Dorn Company, Cleveland, Ohio

Filed Apr. 16, 1982, Ser. No. 369,216
Int. Cl.³ B65D *17/34*
U.S. Cl. 220—269 7 Claims



1. In a metal can end of a type having a seam flange adapted to be connected by seam means to a can body which can end has a recessed corner located below the seam flange with a flat end panel extending inward from the recessed corner, the flat panel having a pear-shaped score line therein defining a removable portion to be torn from said end panel to form a pouring spout opening when pulled by an aluminum pull tab having a ring end and a bottom nose wall connected by a rivet formed integrally in the flat panel and located close to the score line, the pull tab bottom nose wall having slots therein forming an ear-like portion to which the rivet is connected and having a stepped tip spaced from said ear-like portion; wherein the improvement comprises an annealed, tempered, tin-free steel can end; the pear-shaped score line having an outer wider straight end portion connected by rounded corners with inwardly converging terminal portions having spaced-apart ends; the outer straight end score line portion being located close to the can end recessed corner with the pull tab stepped tip overlying and spaced above the center of the outer straight end score line portion; and the pull tab bottom nose wall and panel wall riveted thereto bending on a bend line extending normal to the longitudinal axis of the pull tab which extends through the rivet and stepped tip with the bend line located between the rivet and stepped tip when the ring end of the pull tab is raised to wipe the tip into and across the score line to initially rupture the score line at said center and to spread the rupture in either direction from said center along the outer straight end score line portion.

4,399,926

RESEALABLE EASY-OPENING CONTAINER

Samuel Eidels-Dubovoy, Canal del Norte No. 476 Colonia 20 de Noviembre, Mexico City, Mexico 15300

Filed Apr. 29, 1982, Ser. No. 373,223
Int. Cl.³ B65D *41/04*
U.S. Cl. 220—288 7 Claims

1. A resealable, easy-opening container comprising:

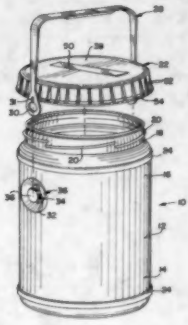
(a) an elongate body portion closed at a lower end and open at an upper end which includes a neck; and

(b) a cover adapted to removably engage the neck of the body portion, said cover including:

(i) a top panel;

(ii) a cylindrical side wall depending from the top panel having means for securing said cover to said neck;

(iii) an annular sealing flange also depending from the top panel but spaced radially inwardly from the side wall, extending downwardly from the top panel to bear against the inner surface of the neck to form a seal to prevent the passage of fluids into or out of the container; and



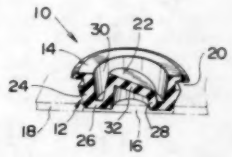
(iv) gripping means comprising an elongate slot formed in the top panel and a plurality of vertical ribs about the cylindrical side wall.

4,399,927

SNAP-ON PLUG

Kouichi Yaotani, Akikawa; Minoru Yoshida, Hachioji, and Oomi Arisaka, Yokohama, all of Japan, assignors to Nissan Motor Company, Limited, Yokohama, Japan

Filed May 20, 1981, Ser. No. 265,363
Claims priority, application Japan, May 21, 1980, 55-68907[U]
Int. Cl.³ B65D *39/00*
U.S. Cl. 220—307 9 Claims



1. A snap-on plug for an apertured panel, comprising:

a hollow shank adapted for insertion within a panel aperture;

a flange extending laterally from one end of said shank; and

a groove formed in the outer surface of said shank at a location adjacent said flange and adapted for engagement with the panel;

said shank having an inner surface portion upon which a force is applied when the plug is to be inserted into the panel aperture:

said inner surface portion being inclined with respect to a plane in which said groove is positioned.

4,399,928

CLOSURE CAP

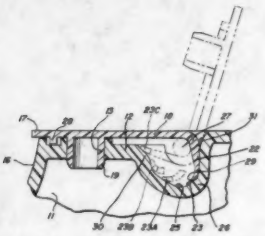
Josef F. Klingler, Wilmette, Ill., assignor to Janler Corporation, Chicago, Ill.

Filed Apr. 14, 1982, Ser. No. 368,369
Int. Cl.³ B65D *43/24*
U.S. Cl. 220—335 10 Claims

1. In a closure cap having a connecting portion and a distal end wall defining a dispenser port, and a stopper tab having a finger-manipulating portion, a stopper portion arranged to be fitted removably in said port for selectively closing said port, and a pivot portion pivotally mounted to said end wall, the improvement comprising:

a concave portion of said end wall defining a camming surface; and

a resilient finger on said stopper tab having a tip portion slidably engaging said camming surface, said camming surface defining means for causing said finger tip to be deflected by its engagement with said camming surface when said stopper tab is arranged with said stopper portion received in said port so as to bias the stopper tab



toward the axis of said pivot portion, said camming surface further defining means for causing said finger tip to bias the stopper tab pivotally toward an open position wherein the stopper portion is spaced from said port as a result of said stopper tab being moved from the port-closing disposition, and said camming surface further defining retaining means for causing the stopper tab to be releasably retained in a fully open pivotal position.

4,399,929

BOX SPOUT

Paul J. Scaglione, 30180 Richmond Hill Dr., Farmington Hills, Mich. 48018

Filed Jul. 24, 1981, Ser. No. 286,075

Int. Cl.³ B67B *7/24*

U.S. Cl. 222—81 **7 Claims**

1. A pouring spout attachable to a vertical side wall of a box formed of cardboard or the like for discharging the box contents, characterized in that:

(a) said spout has a pair of spaced apart walls including an inner wall and an outer wall which are integrally joined at their upper ends, and the spout is open on the upper end and along the rear side thereof;

(b) the inner wall is longer than the outer wall and it is provided with longitudinal converging marginal cutting edges which terminate in a cutting point at the lower end thereof;

(c) a longitudinal central cutting edge is formed on the outer surface of the inner wall;

(d) the inner and outer walls extend forwardly in plan cross section;

(e) the longitudinal edges of the outer wall converge toward its lower end;

(f) a plurality of spaced apart longitudinal ribs are mounted on the outer surface of the inner wall; and,

(g) the outer wall is disposed in a position diverging downwardly and outwardly from the inner wall, whereby when the cutting point on the spout inner wall is inserted into a vertical side wall of a box in a position perpendicular thereto, and the spout inner wall is moved inwardly into the box until the spout outer wall engages said box wall, a substantial horizontal cut is made in said box wall and a vertical, downwardly extending cut that communicates with the horizontal cut is made in said box wall and the forwardly extended inner wall folds inwardly the lower edge portions of said box wall, along the horizontal cut and on each side of the vertical cut, and then the spout is pivoted upwardly into an abutting relationship with the box wall and said lower edge portions of the box wall are then moved longitudinally between said spout walls, and wedges therebetween by said longitudinal ribs, when the spout is next moved downwardly relative to the box wall.

4,399,930

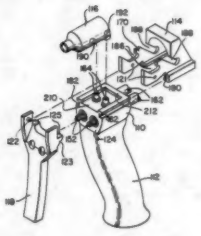
FOAM DISPENSING GUN

Gary C. Harding, Thonotosassa, Fla., assignor to Universal Foam Systems, Inc., Cudahy, Wis.

Continuation-in-part of Ser. No. 266,494, May 22, 1981, abandoned, which is a continuation-in-part of Ser. No. 159,461, Jun. 16, 1980, Pat. No. 4,311,254. This application Nov. 2, 1981, Ser. No. 317,384

Int. Cl.³ B05B *7/12*

U.S. Cl. 222—145 **10 Claims**



1. A foam dispensing gun adapted to be connected to separate pressurized fluid components to be mixed and dispensed from the gun, said gun comprising:

a gun body having a pair of fluid passageways adapted to be connected to the respective pressurized fluid components, and a pair of nipples fixed to and projecting from said body on one of two mutually perpendicular axes, said nipples defining outlets for said passageways;

valve means for controlling the flow of fluid components through said passageways to said nipples;

a disposable nozzle having a pair of inlet openings to receive and establish fluid communication with said nipples;

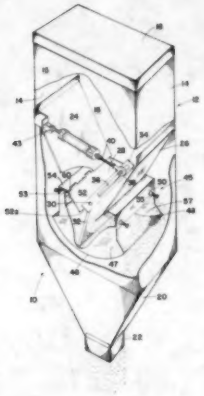
a breech slidable on said gun body in a direction parallel to the other of said two axes between a first position in which it is retracted to permit movement of the nozzle on said one directional axis so that said nipples are received in said inlet openings, a second position for retaining said nozzle in an operative orientation with respect to said gun body, and a third position forwardly of said second position from said first position in the absence of a nozzle member in said operative position; and

trigger means pivotally supported from said breech to be in an operative position for actuating said valve means only when said breech is in said second position.

4,399,931
DRY MATERIAL DISPENSER

Richard E. Maddalena, 139 Lakeville St., Petaluma, Calif. 94952

Filed Mar. 24, 1981, Ser. No. 247,102
Int. Cl.³ G01F 11/00
U.S. Cl. 222—282 3 Claims

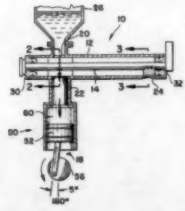


1. A dry material dispensing device comprising:
a hopper;
a paddle pivotable in said hopper on a horizontal axis;
an arcuate concave tray disposed beneath said paddle and coaxial therewith;
means for oscillating said paddle to sweep contents of said tray alternately from opposite ends thereof;
sloping delivery panels in said hopper having outer edges above and parallel to the axis of said paddle said panels converging to a delivery opening between their opposing inner edges below said horizontal axis which is transversed by said paddle during oscillation;
said opposing inner edges being engagable by the sides of said paddle;
hinge means along said outer edges of said delivery panels pivotally mounting said panels in said hopper; and
adjustable stop members on said hopper engagable with the backs of said delivery panels to adjust the slope thereof and to limit the oscillation of said paddle.

4,399,932
VOLUMETRIC METERING VALVE

Guenter Zimmermann, 600 Casler, Clearwater, Fla. 33515

Filed Jun. 2, 1981, Ser. No. 269,462
Int. Cl.³ B67D 5/46
U.S. Cl. 222—380 7 Claims

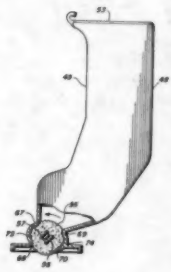


1. A double shoe volumetric metering valve comprising an elongated hollow valve housing having a feed port and a supply port formed in one end portion thereof and a discharge port formed in the opposite end portion thereof, a rotatable shaft having a first and second valve shoe operatively mounted thereon disposed within the elongated hollow valve housing, a valve shoe position control coupled to the rotatable shaft to selectively move said first and second valve shoes relative to said feed port and discharge port to selectively open and close said feed port and discharge port respectively wherein said first and second valve shoes are offset relative to each other on said rotatable shaft and a volumetric feed control in operative communication with said feed port and supply port to selectively draw foodstuff or the like from a supply hopper through said feed port into said elongated hollow valve housing and discharge the food stuff from said remotely disposed discharged port.

4,399,933
TONER DISPENSING APPARATUS

David G. Anderson, Rochester; John J. Bigenwald, Penfield, and Joseph Fantuzzo, Webster, all of N.Y., assignors to Xerox Corporation, Stamford, Conn.

Filed Jul. 27, 1981, Ser. No. 287,322
Int. Cl.³ G01F 13/00
U.S. Cl. 222—407 13 Claims



1. A toner dispensing apparatus comprising a toner hopper for containing a quantity of finely divided toner, said hopper having an elongated opening formed by the cooperation of the walls thereof through which toner is capable of being dispensed from said hopper, and
a dispensing roll to dispense toner from said hopper through said elongated opening of said hopper, said dispensing roll comprising a generally cylindrical resiliently deformable foam roll having a plurality of depressions of predetermined size, shape and volume uniformly disposed on the roll surface, said depressions being capable of holding therein toner to be transported, said resilient deformable foam roll including said depressions having a thin toner impermeable surface thereon formed of the same material and as the continuous skin of the foam.

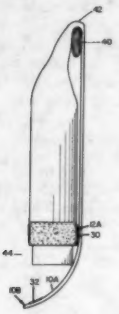
4,399,934
BELT ATTACHED CARRIER

Colyer L. Dupont, 537 Jones #898, San Francisco, Calif. 94102

Filed Jun. 8, 1981, Ser. No. 271,548
Int. Cl.³ A45C 11/00
U.S. Cl. 224—240 4 Claims

1. In a carrier for an article such as a pocket knife, container, or the like, the combination comprising
an elongated member comprising a flexible generally rectangular-shaped sheet having opposite side edges and first and second opposite end edges,
means for joining said side edges together and opposite halves of said second end edges together to form an elongated tubular member open at said first end to receive an article to be carried and closed at said second end,
first releasable fastening means for releasably securing a first

portion of the tubular member adjacent said first end thereof to a portion of the tubular member intermediate said opposite ends to form a loop for suspending the tubular member from a waist belt, or the like, worn by a user with the opposite ends of the tubular member extending downwardly, and



second releasably fastening means for releasably securing the tubular member adjacent the second end thereof to another portion of the tubular member adjacent said first end thereof to provide a releasable movable closure for the downwardly facing open free end of the member for support of an article in the carrier in the closed condition of the closure.

4,399,935

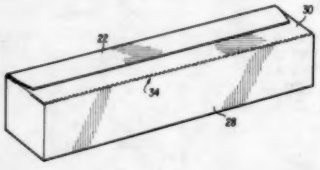
CARTON CONSTRUCTION AND METHOD OF MAKING A CUTTING EDGE THEREFOR

Barbara L. Nelder, 5455 Catterick Rd., Richmond, Va. 23234

Filed Feb. 11, 1981, Ser. No. 233,406

Int. Cl.³ B26D *1/02;* **B65D** *85/671*

U.S. Cl. 225—49 **5 Claims**



5. In a paperboard carton construction of the type having front, back, top and bottom main panels and an adhesive flap pivotally secured to said top main panel and adhesively secured to said front main panel the improvement which comprises:

a. a cutting edge formed integrally with the carton blank and positioned at the juncture of the front and bottom panels, said cutting edge being formed from a series of individual, closely-spaced teeth each of which is formed from a cut-score that penetrates only partially through the blank, each of said teeth being generally V-shaped with the free terminal leg portions thereof lying along a fold axis established upon erecting the carton and located between said front and bottom main panels.

4,399,936

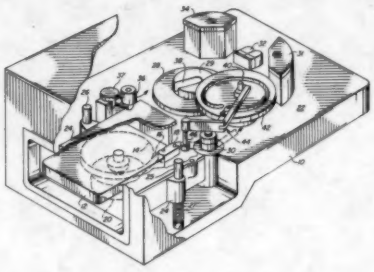
PANTOCAM WEB THREADING APPARATUS

William J. Rueger, Pima County, Ariz., assignor to International Business Machines Corp., Armonk, N.Y.

Filed Oct. 26, 1981, Ser. No. 315,112

Int. Cl.³ G03B *1/04, 1/56*

U.S. Cl. 226—92 **18 Claims**



1. In an automatic threading apparatus for moving a leading end of a web of material wrapped on a supply reel positioned on a web transport, over a web path from a first predefined position to a second position which couples the leading end to a take-up reel disposed on the web transport for subsequent rotational movement with the take-up reel, said threading apparatus comprising in combination:

a cam having a given axis and a groove defining the complex web path circumvoluted about said given axis;

a pantoarm assembly having first and second connection ends;

rotating means connected to said first connection end of said pantoarm assembly and rotatable about said given axis;

a device adapted to couple to the leading end of the web at the first predetermined position, said device attached to said second connection end of said pantoarm assembly;

means connecting said pantoarm assembly intermediate said connection ends to said cam groove, wherein said rotating means causes said pantoarm assembly to describe a circumvoluted path with said connecting means following said cam groove to cause the pantoarm assembly to move through the complex web path to direct said device from the first defined position to the second position.

4,399,937

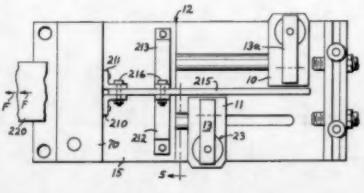
HIGH SPEED DUAL SLIDE STOCK FEEDER

Albert W. Scribner, 6 Country Club Rd., Darien, Conn. 06820

Filed Nov. 4, 1981, Ser. No. 318,200

Int. Cl.³ B65H *17/34, 23/00*

U.S. Cl. 226—162 **4 Claims**



1. A pneumatic feeder for intermittently advancing thin stock into the work station of a punch press or the like: comprising the combination of

a frame;

a cooperating pair of laterally opposed feed slides reciprocally mounted on said frame;

stock gripping means carried by each of said two feed slides, said stock gripping means having mutually facing inner ends; fluid motor means for actuating said stock gripping means; a main fluid motor means for actuating said two feed slides in opposed phase relation so that said feed slides one after the other may produce the successive stock feed strokes of the feeder, the resultant reciprocation of said stock gripping means with said feed slides thereby effectively defining a horizontal stock feed plane;

stock guide means carried by said frame for retaining the stock located in the feeder in said feed plane;

said stock guide means including a guide member supported so as to extend longitudinally of the feeder and between the mutually facing inner ends of said reciprocating stock gripping means;

said guide member having a horizontal edge surface that is adapted to be disposed immediately adjacent the surface of that longitudinal center portion of said stock that is located between the said inner ends of said two stock gripping means so as to prevent buckling of the successive portions of the stock located in the feeder during feed operations.

4,399,938

TACKER

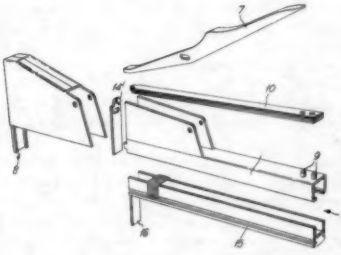
Howard W. Biddle, Histon, England, assignor to Ofrex Group Limited, London, England

Filed Oct. 14, 1980, Ser. No. 197,012

Claims priority, application United Kingdom, Oct. 15, 1979, 7935721

Int. Cl.³ B25C *5/06*

U.S. Cl. 227—132 **7 Claims**



1. A stapler capable of applying staples perpendicularly to interior portions of large flat areas, said stapler comprising a magazine, a quantity of staples mounted in said magazine so as to be individually ejected therefrom, means defining an ejection slot adjacent one end of the magazine, means to bias said staples within the magazine to said one end thereof, a striker movable within said ejection slot to eject said staples, spring means for biassing said striker to a staple ejecting position and an integral handle and pawl adapted to engage said striker and move said striker against said spring bias, said pawl being subsequently disengageable from the striker to release the striker, the arrangement being such that the handle and part of the magazine are spaced apart by such a distance to enable the handle and the magazine to be grasped by a single hand so that the user's fingers extend beneath the magazine, the handle, on operation of the device, moving towards the magazine and wherein said ejection slot extends downwardly, and guide means communicating with said ejection slot and extending downwardly from said magazine opposite said handle a distance equal to or greater than the thickness of a user's fingers extending about the lower surface of said magazine for guiding individual staples ejected from the magazine by the striker.

4,399,939

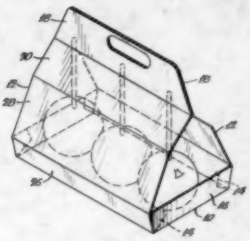
CARAMEL OR CANDY APPLE CARTON

Abraham L. Tunick, Rock Island, Ill., assignor to Karmelkorn Shoppes, Inc., Rock Island, Ill.

Filed Jan. 11, 1982, Ser. No. 338,472

Int. Cl.³ B65D *5/46, 85/34*

U.S. Cl. 229—52 B **1 Claim**



1. A paperboard carton for containing, holding and carrying, in an inverted position, a plurality of caramel or candy apples each having a stick therein, comprising a unitary paperboard blank cut and scored to define and consisting essentially of:

a bottom panel having two opposing U-shaped slits, one adjacent each end of said bottom panel, and each forming a tab directed outwardly toward the respective end of the panel, the bottom panel being adapted to receive caramel or candy apples in an inverted position with their sticks pointed upwardly;

two side panels integral with and foldable along score lines at the side edges of said bottom panel, said side panels each having two lengthwise score lines therein dividing said side panels into lower, middle and upper portions, said side panels being folded at the score lines so that the lower portions extend upwardly and outwardly from said bottom panel, the middle portions extend inwardly and primarily upwardly from the lower portions and the upper portions extend upwardly and primarily inwardly from the middle portions, with the upper edges of the upper portions in contact with one another and the opposite sides of the upper ends of the sticks in the apples, said side panels thereby surrounding the side and upper surfaces of the apples without coming into contact with the apples;

two pairs of corner flaps, each pair being integral with and foldable relative to the opposite ends of the lower portion of each of said side panels along score lines perpendicular thereto, said corner flaps being foldable inwardly, perpendicular to both said side panels and said bottom panel;

two end panels integral with and foldable relative to the ends of said bottom panel along score lines perpendicular thereto, said end panels each having two lengthwise score lines therein dividing each end panels into exterior, interior, and tongue portions, said end panels being folded at their score lines so that the exterior portions extend upwardly, perpendicular to said bottom panel, outside of said corner flaps, the interior portions being folded over said corner flaps and extending downwardly inside of said corner flaps to said bottom panel and the tongue portions extending inwardly in the plane of said bottom panel, and locking underneath the tabs formed by the U-shaped slits in said bottom panel;

said bottom and end panels and the lower portions of said side panels forming a set-up tray for holding and containing the apples; and

two handle panels integral with and foldable relative to the upper edges of the upper portions of said side panels, and having hand holes therethrough, said handle panels extending vertically upward parallel to each other and fastened together, thereby to therebetween sandwich the

sticks of the caramel and candy apples, for holding the apples in place, the hand holes defining a composite handle for carrying the carton and the apples.

4,399,940

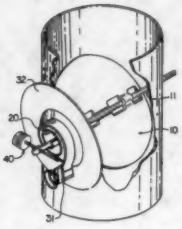
AUTOMATIC STOVE DAMPER CONTROL

Donald E. Stiles, Rte. 1, Honor, Mich. 49640

Filed Apr. 23, 1982, Ser. No. 371,065

Int. Cl.³ G05D *23/08*

U.S. Cl. 236—1 G **21 Claims**



1. An automatic stove damper assembly, comprising:

a damper plate disposed to damp a stove pipe;

a temperature responsive element having a configuration which changes when the temperature surrounding said response element changes, said temperature response element being operatively connected to said damper plate to change damping position thereof, so that as said configuration of said thermal response element changes the position of said damper plate is changed;

adjustment means movably related to said temperature response element for releasably and movably orienting said temperature response element, to that moving said adjustment means changes the orientation of said temperature responsive element in relation to said damper to change the position of said damper at predetermined different temperatures for calibrating the operation of said damper.

4,399,941

RAIL CLAMP

Marius H. Lubbers, The Hague, Netherlands, assignor to Everts & Van der Weyden Exploitatiemaatschappij Ewem B.V., The Hague, Netherlands

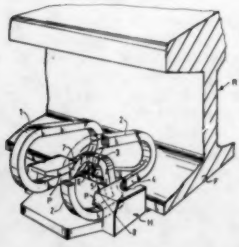
PCT No. PCT/NL80/00028, § 371 Date Apr. 10, 1981, § 102(e) Date Apr. 10, 1981, PCT Pub. No. WO81/00581, PCT Pub. Date Mar. 5, 1981

PCT Filed Aug. 28, 1980, Ser. No. 253,853

Claims priority, application Netherlands, Aug. 28, 1979, 7906455

Int. Cl.³ E01B *9/02*

U.S. Cl. 238—349 **4 Claims**



1. A rail clamp in the form of two parts curved in the shape of a C each C having spaced end portions, the C's being interconnected by a tie loop formed from an end portion of each C, characterized in that each of the end portions of said C's opposite said tie loop presents a plurality of fingers and the tie loop has a portion which overlies at least one of said fingers.

4,399,942

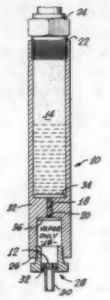
GAS EMITTING DEVICE

Ramesh Chand, Woodland Hills, Calif., assignor to GC Industries, Chatsworth, Calif.

Filed Nov. 9, 1981, Ser. No. 319,462

Int. Cl.³ B05B *17/00*

U.S. Cl. 239—34 **16 Claims**



1. A gas emitting device, comprising:

a first chamber, in which a substance to be emitted is stored at least in part in the liquid phase;

a second chamber, in which the substance to be emitted is stored solely in the gaseous phase, said second chamber having an exit;

fluid communication means connecting said first and second chambers;

a first quantity of permeable material located at said exit to provide a preselected rate of permeation of gas from said device; and

a second quantity of permeable material positioned in said fluid communication means, to permit permeation of gas, but not liquid, into said second chamber;

whereby the emission rate from said device is relatively insensitive to temperature variations, but may be maintained at high levels over long periods of operation because of the high storage capacity of said first chamber.

4,399,943

FLUID INJECTOR

Barry J. Cohen, Snodland; Joseph Scaramuzza, and Graham Tock, both of Huddersfield, all of England, assignors to Peabody Holmes Limited, Huddersfield, England

Filed Aug. 20, 1981, Ser. No. 294,543

Claims priority, application United Kingdom, Aug. 22, 1980, 8027477

Int. Cl.³ B05B *9/03*

U.S. Cl. 239—125 **8 Claims**

1. A fluid injector comprising

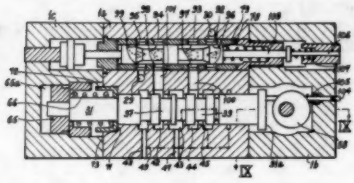
a valve housing

an injector assembly including discharging means for discharging fluid from the injector assembly, ducting for conveying said fluid between said valve housing and said discharging means and a control valve movable to a first position in response to flow of said fluid in a first direction through said ducting to close said discharging means and return said fluid from said discharging means to said valve housing and movable to a second position in response to flow of said fluid in a second direction through said duct-

ing to open said discharging means to allow at least some of the fluid conveyed to said discharging means to be discharged therefrom and to return any surplus fluid to said valve housing,

inlet and outlet passages in said valve housing for conveying said fluid into and from said valve housing,

a change-over valve in said valve housing comprising a valve member adjustable into a first position to condition the injector for flow of said fluid from said inlet passage through said ducting in said first direction and into a second position to condition the injector for flow of said fluid from said inlet passage through said ducting in said second direction, and



a spill return valve in said valve housing for varying the proportion between the amount of fluid that is allowed to discharge from said discharging means and the amount that is returned from said discharging means to said valve housing when said control valve is in its said second position, said spill return valve comprising a valve member adjustable relative to first and second fluid flow restricting means, whereby both the flow of fluid from the spill return valve to the injector assembly and the flow of fluid from the injector assembly to the spill return valve can be varied simultaneously.

4,399,944

ELECTROMAGNETIC FUEL INJECTION VALVE AND PROCESS TO MANUFACTURE AN ELECTROMAGNETIC FUEL INJECTION VALVE

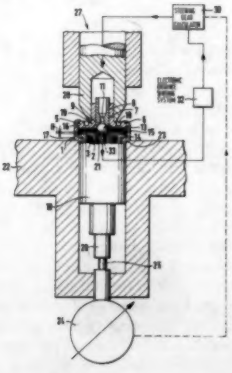
Rudolf Krauss, Stuttgart, and Rudolf Sauer, Benningen, both of Fed. Rep. of Germany, assignors to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany

Filed Jul. 21, 1981, Ser. No. 285,679

Claims priority, application Fed. Rep. of Germany, Aug. 21, 1980, 3031564

Int. Cl.³ B05B *1/30;* **F02M** *51/00*

U.S. Cl. 239—585 **2 Claims**



1. An electromagnetic fuel injection valve comprising:

a movable valve section guided in a valve housing actuable via an armature,

a fixed valve seat cooperating with said valve section and embodied on a nozzle body supported in a nozzle carrier,

said nozzle carrier has an annular groove which weakens the thickness of the nozzle carrier in an axial direction in such a manner that an inner area of the nozzle carrier is deformed in an axial direction in an assembled condition of the fuel injection valve, and

the nozzle body is movable in an axial direction for adjustment of the armature stroke (H) in an assembled condition of the fuel injection valve.

4,399,945

POWDER SPRAYER

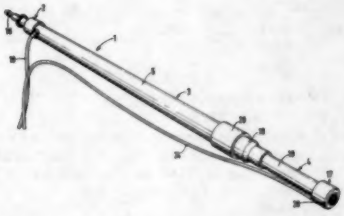
Jan T. Ruud, Fregattgränd 1, 44074 Hjälteby, Sweden

Filed Dec. 30, 1980, Ser. No. 221,443

Claims priority, application Sweden, Jan. 4, 1980, 8000065; Nov. 12, 1980, 8007919

Int. Cl.³ B05B *5/02*

U.S. Cl. 239—697 **10 Claims**



1. Powder sprayer (1) with electrostatic charging capacity, the powder sprayer including a discharge nozzle (4), characterized by comprising a number of tortuously curved charging ducts (6,6') of long extension and made of electrically non-conducting material, by way of example plastic material, particle charging means for electrostatically charging the powder material during the movement of the powder material through said charging ducts (6,6') prior to entering the discharge nozzle, said charging means including electrical coating means on the outer surfaces of said ducts, said electrical coating means extending along the main portion of the extension of said ducts, said charging means further including a conductor (8, 10) for ground connection or for powder source connection, said charging means being located essentially completely within the spray gun and effecting charging of powder flowing through said ducts by contact between the powder and the inner walls of the ducts when the sprayer (1) is in use.

4,399,946

METHOD AND APPARATUS FOR PRODUCING CEMENT OR PLASTER

Christopher Stevenson, Bromyard, England, assignor to Mono Oakes Limited, Macclesfield, England

Filed Jan. 15, 1981, Ser. No. 225,245

Claims priority, application United Kingdom, Jan. 22, 1980, 8002136

Int. Cl.³ B02C *18/06, 23/36*

U.S. Cl. 241—21 **11 Claims**

1. An apparatus for forming a cement or plaster slurry and for pumping the slurry onward, the apparatus comprising:

a. a substantially closed chamber for receiving bags of cement or plaster, said chamber having a top and a bottom;

b. a macerator within said closed chamber for macerating bags of cement or plaster within said chamber and for forming a slurry of cement or plaster, macerated bag material, and water;

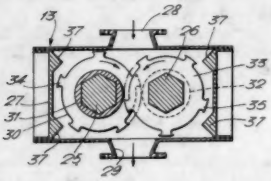
c. means at the top of said chamber for permitting full bags

of cement or plaster to be fed into said chamber, while maintaining said chamber substantially closed;

d. means for introducing water into said chamber;

e. means for controlling the rate of introduction of water into said chamber;

f. an outlet of the chamber located at the bottom thereof;



g. a positive displacement pump mounted below said outlet of the chamber; and

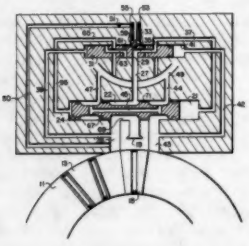
h. an inlet to said pump connected to said outlet of the chamber so that the resulting slurry of cement or plaster, macerated bag material and water flows by gravity into said pump inlet and the resulting slurry is pumped to a point of use by said pump.

4,399,947

VALVE MECHANISM FOR A WATER OPERATED WASTE DISPOSAL UNIT

Leonard G. Spelber, and Abraham I. Tucker, both of San Diego, Calif., assignors to Wastemate Corp., San Diego, Calif.

Filed Oct. 16, 1981, Ser. No. 312,093
Int. Cl.³ B02C *18/40*
U.S. Cl. 241—46 B **9 Claims**



1. A valve assembly for a water actuated waste disposal unit that includes an annular toroidal chamber with stop means therein and an operating piston slidably mounted in said toroidal chamber and connected with cutting means for cyclically rotating said cutting means in opposite directions, said toroidal chamber having water inlet means on each side of said stop means, comprising:

a valve unit having source connection means for connection to a source of pressurized water and including a valve body having a control cylinder therein;

chamber connecting passage means in said valve body communicating with said toroidal chamber;

a control piston slidably disposed in said control cylinder and including a circumferential supply channel for providing supply water from said source connection means through first passage means in said valve body;

a pair of circumferential exhaust channels on said control piston, one on each side of said circumferential supply channel and separated therefrom by land means on said control piston, and alternately connected by second passage means internally located in said control piston for exhausting water through third passage means in said valve body;

a pilot cylinder in said valve body;

a pilot piston slidably disposed in said pilot cylinder, said pilot piston having internal channels for mating with said first passage means in said valve body and diverting supply water alternately to opposite ends of said control cylinder, the opposite ends of said pilot cylinder being connected with said chamber connecting passage means whereby the pilot piston is responsive to differential pressure on opposite sides of said chamber connecting passage means;

spaced apart pairs of openings on the circumference of said pilot piston for alternately aligning with said first passage means in said valve body, each of said pairs of openings communicating with a separate internal passage in said pilot piston;

exhaust passages in said pilot piston for alternately aligning with exhaust passages in said valve body to exhaust water from each end of the said control cylinder; and

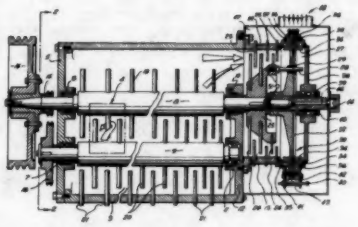
biasing means for holding said pilot piston at each end of its reciprocating stroke, said biasing means preventing movement of said pilot piston between opposite ends of the pilot cylinder below a predetermined pressure.

4,399,948

PULVERIZER

Peter Treffner, and Charles Treffner, both of 43 Yangoora Rd., Belmore, N.S.W. 2192, Australia

Filed Sep. 23, 1980, Ser. No. 189,566
Claims priority, application Australia, Oct. 9, 1979, PE0842
Int. Cl.³ B02C *13/06, 13/22*
U.S. Cl. 241—152 A **22 Claims**



1. Apparatus for disintegrating scrap plastics foam material into its composite beads comprising:

a double sided granulator rotor having a plurality of breaker pins projecting from each side thereof;

a housing around said rotor having two sets of stationary pins projecting therefrom, one set interdigitating with the pins on one side of the rotor and the other set interdigitating with the pins on the other side thereof;

said housing having an exit for the scrap plastics pieces along at least part of the periphery of the housing, radially outward from the axis of rotation;

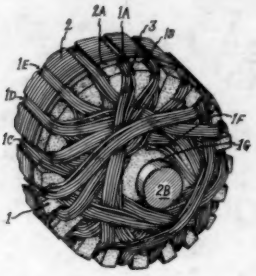
at least one of the inner walls of the housing being at an angle to the rotational plane of the rotor so as to present an exit path of decreasing cross-sectional area in the direction of the exit, the rotor extending radially outwardly into the peripheral exit, dividing it into two portions and the housing comprising two axially spaced apart portions with means to move said portions toward and away from each other so as to vary the width of said peripheral exit.

4,399,949

WINDING FORM FOR DYNAMOELECTRIC MACHINE

William B. Penn, and Kenneth R. Reynolds, both of Erie, Pa., assignors to General Electric Company, Research Triangle Park, N.C.

Filed Dec. 23, 1980, Ser. No. 219,553
Int. Cl.³ H02K 15/14, 15/09
U.S. Cl. 242—1 4 Claims



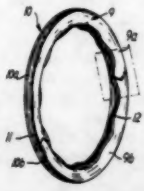
1. A winding form for positioning an electrical winding in a predetermined configuration on an electrical apparatus to define air passageways between an axially outer surface portion of the apparatus and end turn portions of the winding, comprising a body of relatively rigid material having a first surface that generally defines a portion of the outline of said predetermined configuration and having a second surface that conforms generally to a preselected axially outer surface portion of said apparatus, said body of material being effective when positioned on said axially outer surface portion of the apparatus to support turns of an insulated electrical winding on the apparatus in spaced relation to one another and to said preselected axially outer surface portion of the apparatus, said body of material being capable of being readily dissolved to enable it to be essentially completely removed from between the winding turns and the axially outer surface portions of the apparatus without impairing the insulation on the winding turns, said body of material comprising a body of foamed polystyrene.

4,399,950

MAGAZINE FOR WINDING WIRE ON ENDLESS ANNULAR MEMBERS OR CORES

Jan B. Pedersen, Hvalso, Denmark, assignor to Tortrix A/S, Vejle, Denmark

PCT No. PCT/DK80/00057, § 371 Date May 13, 1981, § 102(e) Date May 13, 1981, PCT Pub. No. WO81/00840, PCT Pub. Date Apr. 2, 1981
PCT Filed Sep. 18, 1980, Ser. No. 269,017
Int. Cl.³ H01F 41/08
U.S. Cl. 242—4 B 9 Claims



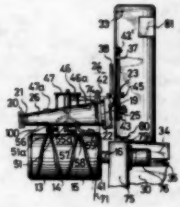
1. A wire magazine for winding wire for use in a winding machine for the winding of elongate members or cores, particularly endless cores, said machine comprising a machine frame with a magazine holder including guide means and driving means for rotational movement of the wire magazine, said wire magazine comprising two annular halves, each of which is composed of two semi-annular parts separated by joining faces and limiting together a wire supply space, the cross-sectional area of which is considerably greater than the wire diameter, said two halves being separated by a bottom slit facing an axis of revolution for the wire magazine, through which winding wire is drawn out from the wire magazine, said two magazine halves being formed with thin walls having a substantially semi-circular cross-sectional form to provide a substantially closed storage space, said two halves being separated opposite to said bottom slit by a single wire filling slit, said two halves being formed with edge portions having opposed walls limiting said bottom slit, the surfaces of said opposed walls deviating from a planar parallel relationship to the symmetry plane of the wire magazine normal to the axis of revolution.

4,399,951

COIL CHANGING DEVICE

Hans-Jürgen Preuhs, Willich, Fed. Rep. of Germany, assignor to W. Schlafhorst & Co., Monchen-Gladbach, Fed. Rep. of Germany

Filed Nov. 26, 1980, Ser. No. 210,374
Claims priority, application Fed. Rep. of Germany, Nov. 28, 1979, 2947901
Int. Cl.³ B65H 54/02, 54/42, 67/04
U.S. Cl. 242—18 DD 5 Claims



1. Coil changing device, comprising a cross-wound bobbin winding device having a bobbin frame for receiving coil sleeves to be wound, and a winding roller for driving a coil sleeve in said bobbin frame; and a coil changing device being movable to said bobbin winding device for inserting a new coil sleeve in said bobbin frame, and coil changing device including a friction wheel drive having a support and at least one friction wheel being carried by said support, said at least one friction wheel being driveable by said winding roller for frictionally driving the coil sleeve in turn, and said at least one friction wheel having a longitudinal axis and being slideable on said support in direction of said longitudinal axis for axially moving the coil sleeve when changing coil sleeves.

4,399,952

THREAD DELIVERY APPARATUS

Werner Schaub, Riken, Switzerland, assignor to Schaub & Cie AG, Vordemwald, Switzerland

Filed Feb. 23, 1981, Ser. No. 236,647
Claims priority, application Switzerland, Mar. 3, 1980, 1680/80
Int. Cl.³ B65H 51/24
U.S. Cl. 242—47.05 8 Claims

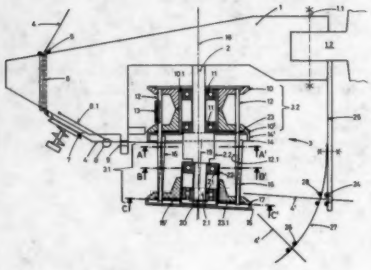
1. In thread delivery apparatus comprising:
a spindle having a shoulder portion and attached to the apparatus;
a driving wheel rotatably mounted on said spindle, said driving wheel including at its periphery a first circular array of rods;
a spigot extending eccentrically from said shoulder portion of said spindle;
a driven wheel rotatably mounted on said spigot, said driven

wheel including at its periphery a second circular array of rods;

said first circular array of rods of said driving wheel extending to said driven wheel for driving said driven wheel and forming with said second circular array of rods of said driven wheel a thread control zone between said wheels;

the axes of said wheels being in a common plane and the angle between the axes of said spigot and said spindle being such that said axes of said wheels intersect outside said thread control zone;

said driving wheel comprising a mounting disc rotatably mounted on said spindle and supporting said first circular array of rods at the periphery of said driving wheel, and



said driven wheel comprising a mounting disc rotatably mounted on said spigot and a centering disc which is secured to said mounting disc of said driven wheel and having a circular array of apertures, drive being transmitted from said driving wheel to said driven wheel by distal portions of said rods of said first array being slidably received in said circular array of apertures of said centering disc;

said axes of said wheels intersecting in the general plane of said centering disc, whereby rotation of said driving wheel and said driven wheel results in winding of a thread around said rods in said thread control zone with displacement of the turns of the thread occurring axially of said driven wheel.

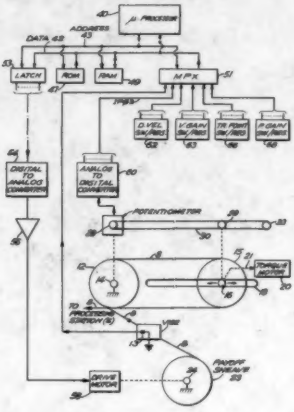
4,399,953

WIRE AND CABLE PROCESS CONTROL APPARATUS

John L. Macchia, Richmond, Ky., assignor to The Okonite Company, Ramsey, N.J.

Filed Nov. 18, 1981, Ser. No. 322,577
Int. Cl.³ B65H *51/08, 51/20*
U.S. Cl. 242—47.08 **12 Claims**

1. In combination, a cable-bearing pay off sheave, first and second cable storing sheaves having a variable spacing therebetween, cable passing from said pay off sheave to and about said first and second cable storing sheaves, and controller means for controlling the distance between said first and second cable storing sheaves for providing cable in the absence of cable available from said pay off sheave and for restoring the separation between said first and second sheave, said controller means including digital processing means, sensor means for providing to said digital processing means a signal representative of the distance between said first and second storage sheaves, drive means for driving said pay off sheave, and



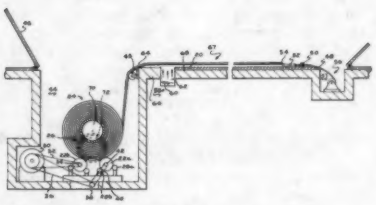
means responsive to an output from said digital processing means for controlling said drive means.

4,399,954

MANIPULATING LARGE SECTIONS OF ARTIFICIAL TURF

Kearney D. Arrant, Florissant, Mo., assignor to Monsanto Company, St. Louis, Mo.

Filed Nov. 20, 1980, Ser. No. 208,626
Int. Cl.³ A63C *19/12;* **B65H** *17/46*
U.S. Cl. 242—86.52 **11 Claims**



1. A method of removably covering a floor with a large section of substantially impervious, heavy duty artificial turf which comprises:

(a) dragging the leading margin from a roll of said artificial turf across an initial portion of a floor via the application of a pulling force at plural locations along said leading margin, wherein said roll is supported on at least one powered support roller;

(b) turning said roll of said artificial turf comprising the remainder of said section in place in an unwinding direction, while continuing the application of said pulling force to further advance the section across the floor, wherein said turning occurs via frictional contact between the periphery of said roll and said at least one powered support roller;

(c) generating pneumatic pressure between the floor and the overlying section of artificial turf to lift the overlying section within its margins off the floor and minimize friction between the floor and the artificial turf, wherein the margins of the artificial turf section over the floor are in sealing contact with the floor;

(d) continuing the application of pulling force until the floor is covered with the section; and then

(e) relieving the pneumatic pressure to permit the section where lifted to settle onto the floor.

4,399,955

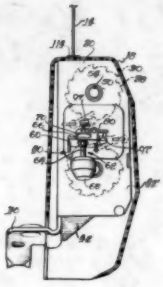
DUAL REEL RETRACTOR

John S. Miskowicz, and David R. Fischbacher, both of La Porte, Ind., assignors to Gateway Industries, Inc., Chicago, Ill.

Filed Feb. 19, 1980, Ser. No. 122,289

Int. Cl.³ A62B *35/02;* **B65H** *75/48*

U.S. Cl. 242—107.4 A **15 Claims**



1. A seat belt retraction apparatus comprising:

a support means;

a pair of reels, the axes of which are coplanar mounted for rotation in said support means;

webbing attached at one end to each of said reels;

biasing means urging each of said reels in a retraction direction to wind said webbing therearound, said webbing extendable from said reels by a pull on said webbing to overcome the force of said biasing means;

ratchet means on each of said reels;

Pawl means including a first pawl rotatable about a first axis to engage said ratchet means of a first one of said reels and a second pawl rotatable about a second axis offset from said first axis to engage a second ratchet means, each of said pawls being displaceable between an unlocking position and a locking position in which each of said pawl means has locking engagement with its associated ratchet means to prevent its rotation in a web extending direction;

a common actuating means displaceable from a rest position to a pawl actuating position to simultaneously actuate each of said pawl means toward said locking position and to move one of said pawl means into locking position irrespective of the other pawl means being blocked momentarily from its locking position; and

an inertia type sensing means to move said common actuating means to said actuating position when said sensing means detects a predetermined force for preventing rotation of each of said reels in a web extending direction.

4,399,956

LOCKING DEVICE FOR THE WEBBING FOR SEAT BELT

Akira Mita, Fujisawa, Japan, assignor to Nippon Seiko Kabushiki Kaisha, Tokyo, Japan

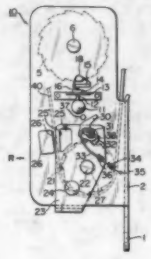
Filed Oct. 5, 1981, Ser. No. 308,397

Claims priority, application Japan, Oct. 11, 1980, 55-142250

Int. Cl.³ A62B *35/02;* **B65H** *75/48*

U.S. Cl. 242—107.2 **3 Claims**

1. In a retractor for a seat belt used in a vehicle wherein a webbing of the seat belt may be drawn from a take-up spool and directed at least partially around a drum mounted rotatably to a drum base secured pivotally to said retractor along an axis offset eccentrically from the axis of rotation of said drum and wherein the webbing may normally be withdrawn from said take-up spool relatively freely so that it may comfortably engage the user; a locking means for locking the webbind during a sudden acceleration or deceleration of the vehicle, said locking means including a sensor for sensing sudden acceleration or deceleration of the vehicle, means including a first restraining element driven by said sensor for preventing rotation of said spool, means including a second restraining element carried by said drum base and driven during initial pivoting of said drum base caused by tension applied to said webbing after said spool has been prevented from rotating for preventing rotation of said drum, a fixed frictional restraining member fixed on the retractor and lying adjacent one side of the webbing, and a movable frictional restraining member carried by said drum base and located oppositely from the fixed frictional restraining member and adapted to be pressed firmly against the other side of the webbing as continued tension of the webbing urges the drum base to pivot further.



4,399,957

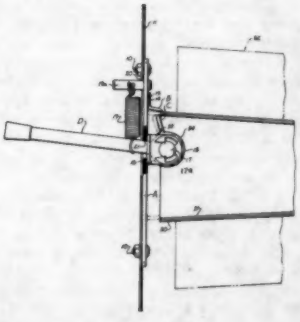
YARN PACKAGE HOLDER

Hans S. Singer, 191 Inglewood, Greenville, S.C. 29615

Filed Dec. 2, 1981, Ser. No. 326,765

Int. Cl.³ B65H *49/10;* **D02H** *1/00;* **D03J** *5/16*

U.S. Cl. 242—130 **2 Claims**



1. A holder for positioning yarn packages as upon creels and the like, said yarn packages including a yarn carrier having an outwardly extending annular lip comprising:

a support;

a first outwardly extending lip receiving wedging member carried by said support;

a second inwardly extending lip receiving wedging member pivotally carried upon said support opposite said first wedging member displaceable upon insertion of said lip in the direction of insertion of the lip between said first and second wedging members for exerting a positive gripping action upon said lip therebetween;

resilient means urging said second wedging members toward said first wedging members;

manually operable means for releasing the gripping action exerted by said wedging members upon said lip;

bracket members fixed to said support-pivotally carrying the second wedging member therebetween; and

camming means opposite said second wedging member guiding said lip between said wedging members;

whereby a yarn package may be conveniently received upon said holder by manual insertion of the lip between the wedging members for positive, manually releasable positioning of the package by exerting a gripping action upon the lip.

4,399,958

TAPE LOOP POSITION DETECTOR

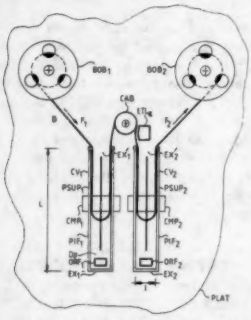
Jean Dupont, La Haye les Roses, France, assignor to Compagnie Internationale pour l'Informatique CII-Honeywell Bull, Paris, France

Filed Aug. 8, 1981, Ser. No. 271,573

Claims priority, application France, Jun. 19, 1980, 80 13599

Int. Cl.[3] G11B *15/58, 23/12*

U.S. Cl. 242—182 **16 Claims**



1. Apparatus for detecting the position of a tape loop in a chamber, the tape being supplied to one end of the chamber, the other end of the chamber being maintained at a fluid pressure less than the one end and being closed by the tape in the chamber, a portion of the chamber where the loop is located including a wall for providing a fluid flow relation between the chamber and the detecting apparatus, the detecting apparatus being responsive to the location of a fluid pressure transition in the chamber resulting from the position of the loop and the fluid pressure difference on opposite sides of the loop, the detecting apparatus comprising a variable capacitor having fixed and flexible electrodes spaced from each other, the fixed electrode being spaced from and parallel to the wall, a stationary solid dielectric positioned between the electrodes, the stationary solid dielectric extending between the electrodes through substantially the same distance as the electrodes, a vacuum source for applying a fluid pressure to the flexible electrode between the pressures at the one and other ends of the chamber, first and second opposite ends of the flexible electrode having faces respectively positioned in first and second planes substantially parallel to the wall, the face in the second plane being on the stationary solid dielectric, the flexible electrode and vacuum source being arranged so that the position of a transition of the flexible electrode from the wall to the region is dependent on the position of the loop in the chamber, whereby a portion of the flexible electrode between the pressures of the one end and of the vacuum source is urged by the higher pressure of the one end against the stationary solid dielectric and a segment of the flexible electrode between the pressures of the other end and the vacuum source is urged by the higher pressure of the vacuum source against the wall.

4,399,959

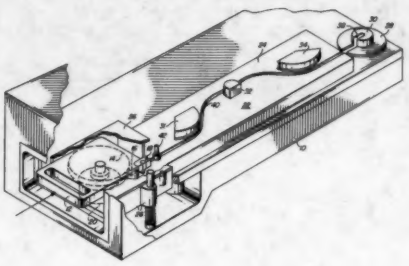
CONSTANT FORCE WINDUP SPRING WEB THREADING SYSTEM

Robert J. Godsoe, and Jack W. Wenner, both of Pima County, Ariz., assignors to International Business Machines Corp., Armonk, N.Y.

Filed Oct. 26, 1981, Ser. No. 315,120

Int. Cl.[3] G03B *1/04, 1/56*

U.S. Cl. 242—195 **8 Claims**



1. In an automatic tape threading apparatus for moving a leading end portion of a tape coiled on a removable supply reel positioned on a tape transport through a circuitous tape path from a first position adjacent the supply reel to a second position at a take-up reel disposed at an opposite end of said circuitous tape path from said supply reel for subsequent co-rotation with said supply reel for transporting said tape therebetween along said circuitous tape path;

including, in combination:

channel guide means on said tape transport extending between said supply and take-up reels adjacent said circuitous tape path and having a geometric configuration similar to the configuration of the tape path such that any motions along said channel guide means are similar to motions along said circuitous tape path;

a negator flexible self-coilable band-shaped spring movably disposed in said channel guide means for reciprocating motions between said supply and take-up reels and having one end affixed to said take-up reel and exhibiting a coilable force sufficient to move said tape from said first to said second position along said circuitous tape path;

a negator spool affixed to a second end of said negator spring and movably disposed in said channel guide means for motions therealong between said supply and take-up reels and adapted to coilingly receive said negator spring and having a tape end engaging pin coaxially extending therefrom toward said circuitous tape path such that as said negator spring coils on the negator spool the tape moves from the first to the second position along said circuitous tape path under the urging of said negator spring;

latch means movably mounted on said tape transport immediately adjacent said first position for movements between a negator spool latching position and a negator spool unlatching position whereby unlatching the latch means threads tape from said supply reel along said circuitous tape path from the supply spool that is attached to said tape-end engaging pin;

means for rotating said supply reel for winding said tape thereon such that the tape is completely removed from said take-up reel;

leader means affixed to the free end of said tape and movable along said circuitous tape path with said tape between said first and second positions and having tape-end engaging pin receiving means for removably receiving said tape-end engaging pin as said supply reel is placed on said tape transport at said first position;

means interposed between said first position and said latch

means for moving said latch means from said latching position to said unlatching position as said supply reel is placed in said first position and from said unlatching position to said latching position as said supply reel is removed from said first position such that said negator spool is latched at said first position whenever no supply spool is at said first position and unlatched for said reciprocating motions when a said supply spool is at said first position; and

said leader means being arranged for carrying said tape engaging pin from said second to said first position as said tape is being wound on said supply reel as said leader means moves from said take-up reel to said supply reel whereby rewinding the tape from the take-up reel onto said supply reel uncoils said negator spring from said negator spool and moves the negator spool to said latch means for enabling threading a tape through said circuitous tape path.

4,399,960

MAGNETIC TAPE CASSETTE

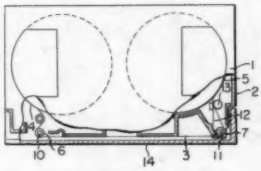
Shigemasa Shoji, Saku, Japan, assignor to TDK Electronics Co., Ltd., Tokyo, Japan

Filed Jan. 14, 1981, Ser. No. 224,950

Claims priority, application Japan, Jan. 14, 1980, 55-3245

Int. Cl.³ G03B *1/04;* G11B *15/32;* B65H *75/34*

U.S. Cl. 242—199 **3 Claims**



1. In a magnetic tape cassette having a pair of reels therein for holding a magnetic tape which travels from one reel from which it is unreeled along a front edge of said cassette to the other reel upon which it is reeled during recording and reproducing, the improvement for guiding said tape along said front edge of said cassette comprising a rotatable tape guide positioned adjacent to both said front edge of said cassette and said one reel from which said tape is unreeled, and a nonrotatable tape guide positioned adjacent to both said front edge of said cassette and said other reel upon which said tape is reeled.

4,399,961

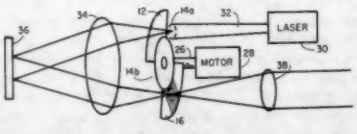
TONE BURST RETICLE BEAMRIDER MISSILE GUIDANCE

Robert R. Mitchell, Huntsville, Ala., assignor to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Apr. 27, 1981, Ser. No. 257,687

Int. Cl.³ F41G *7/26*

U.S. Cl. 244—3.13 **3 Claims**



1. A tone burst reticle beamrider missile guidance system comprising reticle wheel means mounted for rotation at a substantially constant rate and having chopping section means, transparent section means, and opaque section means, a laser source mounted relative to said reticle wheel means and illuminating said reticle wheel means, and lens means for receiving chopped signals from said reticle wheel means and being adapted for projecting the chopped reticle wheel means signals in the direction of a missile, said chopping section means and said transparent section means being located on said reticle wheel means so as to allow first and second tone bursts to be produced and substantially orthogonically spaced, said reticle wheel means being a single wheel that has four segments that are arranged about the circumference of the reticle wheel as a first and transparent section, a second and chopping section with alternate opaque and transparent segments, a third and transparent section and a fourth and opaque section, said first, second, third and fourth sections being said chopping section means, said transparent section means and said opaque section means.

4,399,962

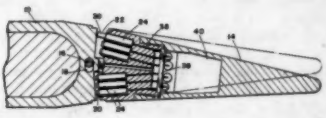
WOBBLE NOSE CONTROL FOR PROJECTILES

Larry D. Wedertz, Mira Loma; Byron M. Niemeier, Claremont, and Oakley G. Ross, Upland, all of Calif., assignors to General Dynamics, Pomona Division, Pomona, Calif.

Filed Aug. 31, 1981, Ser. No. 298,128

Int. Cl.³ F42B *15/14*

U.S. Cl. 244—3.23 **7 Claims**



1. A wobble nose projectile for launching at a target and having a cylindrical body that is rotatable in flight, comprising:

an articulated nose connected to the forward end of said projectile body and locked in axial alignment with the longitudinal axis of the said projectile body; and

pyrotechnic means within said nose for unlocking the nose and tilting said nose toward the target when the directional error of the projectile exceeds a threshold.

4,399,963

ELASTIC TAIL SKID FOR GLIDERS AND LIGHT AIR PLANES

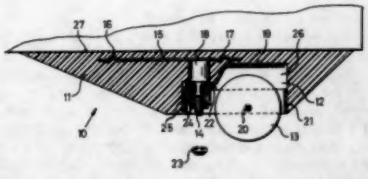
Herbert Schäfer, 6980 Wertheim-Grünenwört, BRD, Fed. Rep. of Germany

Filed Mar. 8, 1982, Ser. No. 356,156

Claims priority, application Fed. Rep. of Germany, Mar. 13, 1981, 8107304[U]

Int. Cl.³ B64C *25/64*

U.S. Cl. 244—104 R **18 Claims**



1. An elastic tail skid for gliders and light air planes, comprising a tail skid body to be mounted on the airframe, said body being made out of elastic material and formed with a recess; a skid element establishing a ground support when the glider or air plane is landed, said skid element being mounted in said recess; a support plate imbedded in said body, said skid

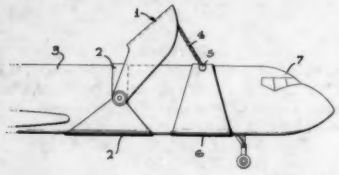
element being yieldingly supported on said support plate; and a vertical spacer bolt rigidly mounted on said support plate, said skid element having a front end and being pivotally supported with said front end relative to said vertical spacer bolt.

4,399,964

SAFETY DEVICE FOR USE IN AIRCRAFT AND AN AIRCRAFT PROVIDED WITH SUCH SAFETY DEVICE

Vellaiappan V. Thangathirupathy, No. 13, Sadasiva Pillai La., Chintadripet, Madras 600 002, Tamil Nady, India

Filed Jan. 28, 1981, Ser. No. 229,115
Int. Cl.³ B64D *45/04*
U.S. Cl. 244—113 **11 Claims**



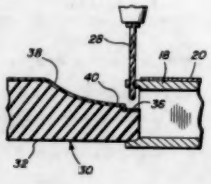
1. A safety device for use with an aircraft, said safety device comprising: a cover which rests apart from and above said aircraft; at least one sleeve member which surrounds the fuselage belly of said aircraft, said cover being movably attached to said at least one sleeve member; and a linking means attached to said at least one sleeve member and operable to move said cover from a first position lying upon the outside surface of the aircraft fuselage to a second position extending forwardly from its attachment to said at least one sleeve member and upwardly from said fuselage.

4,399,965

STRESS PANEL REPAIR INSERT FOR AIRCRAFT

Ned W. Walker, 35 Franklin Rd., Newport News, Va. 23601

Filed Dec. 5, 1980, Ser. No. 213,689
Int. Cl.³ B64C *1/14*
U.S. Cl. 244—129.4 **5 Claims**



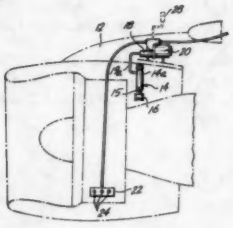
1. In combination with an aircraft airframe of the type including a stress panel receiving opening formed therein having reduced cross sectional area inner and outer ends and an intermediate portion of greater cross sectional area than said ends, an insert for said opening comprising a thick panel of resilient deformable material snugly removably received in said opening substantially entirely intermediate said inner and outer ends and with said inner and outer ends defining opposing surfaces between which said panel is received for resisting displacement of said panel from either said inner end or said outer end, said panel closing said opening intermediate said inner and outer ends against the entrance of foreign material into said airframe from the exterior thereof, said panel being sufficiently resiliently deformable whereby an outer surface portion thereof at a selected marginal area of said panel may be engaged and deflected inwardly away from the marginal portion of said airframe defining the corresponding portion of said reduced cross sectional area outer end of said opening, thereby enabling said airframe marginal portion to have machining operation performed thereon while said insert remains in position closing the inner end of said opening against the entrance of machining cuttings into the interior of said airframe and the intermediate portion of said opening to be vacuumed after the aforementioned machining operation is performed in order to vacuum away machining cuttings prior to removal of said panel.

4,399,966

POWER OPENING SYSTEM FOR ENGINE COWL DOORS

Eric H. Crudden, Mercer Island, and P. Jay Jessen, Snohomish, both of Wash., assignors to The Boeing Company, Seattle, Wash.

Filed Dec. 31, 1980, Ser. No. 221,827
Int. Cl.³ B64C *1/14*
U.S. Cl. 244—129.4 **8 Claims**



1. In an aircraft having a jet engine, said engine having an annular cowl covering at least a portion of said engine, said cowl being longitudinally bifurcated to form first and second cowl portions, each of said cowl portions being hingedly attached to said engine for swinging movement of each of said cowl portions between a first position in which said cowl portions are joined together and a second position in which said cowl portions are spaced from said engine to expose said portion of said engine, an apparatus for moving said cowl portions between their respective first and second positions comprising:

a first linear hydraulic actuator associated with said engine and said first cowl portion and operable to move said first cowl portion from its first position to its second position;

a second linear hydraulic actuator associated with said engine and said second cowl portion and operable to move said second cowl portion from its first position to its second position;

hydraulic fluid reservoir means mounted on said engine for supplying hydraulic fluid to said actuators;

hydraulic control means associated with said hydraulic fluid reservoir means and said linear hydraulic actuators and selectively operable to direct fluid from said reservoir means to said actuators, said hydraulic control means including first valve means associated with said first linear hydraulic actuator, said first valve means selectively operable in a first mode to pass hydraulic fluid from said reservoir means to said first actuator and in a second mode to pass hydraulic fluid from said first actuator to said reservoir means, second valve means associated with said second linear hydraulic actuator, said second valve means being selectively operable in a first mode to pass fluid from said reservoir means to said second actuator and operable in a second mode to pass fluid from said second actuator to said reservoir means, third valve means associated with said first and second linear hydraulic actuators and said reservoir means and selectively operable in a first mode to block the passage of hydraulic fluid from said actuators to said reservoir means and operable in the

second mode to pass fluid from said actuators to said reservoir means; and

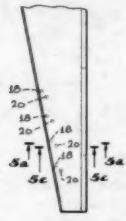
hydraulic pump means mounted on said engine, said pump means having a suction and an exhaust, said suction being in fluid communication with said reservoir means and said exhaust being in fluid communication with said hydraulic control means.

4,399,967

STAGGERED COIL AND NOSE-TORQUER ELECTROMAGNETIC PULSE DEICING SYSTEMS

Paul E. Sandorff, Granada Hills, Calif., assignor to Lockheed Corporation, Burbank, Calif.

Filed Dec. 9, 1980, Ser. No. 214,541
Int. Cl.³ B64D *15/18*
U.S. Cl. 244—134 R **10 Claims**



1. An electromagnetic pulse deicing system for deicing the surface skin of an airfoil, said airfoil including a leading edge portion formed by upper and lower surfaces terminating at a leading edge, said system comprising a plurality of electromagnetic pulse generating devices positioned adjacent to and spaced from said skin and means for electrically activating said plurality of pulse generating devices to produce a resultant deformation of said skin, wherein said plurality of pulse generating devices are arranged in a staggered geometrical array spanwise of said airfoil, whereby upon electric activation of said devices a torsional wave mode deformation of said skin occurs.

4,399,968

CONTROLLED OUTPUT FORCE ACTUATOR

William H. Stock, Columbus, and Bernard C. Holland, Jr., Pickerington, both of Ohio, assignors to Rockwell International Corporation, El Segundo, Calif.

Filed May 16, 1980, Ser. No. 150,465
Int. Cl.³ B64D *1/02*
U.S. Cl. 244—137 R **21 Claims**

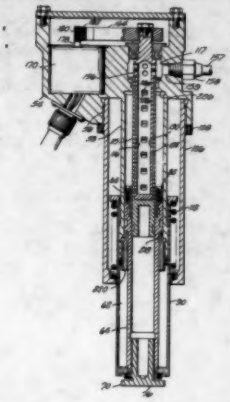
1. An actuator for ejecting an article from an aircraft comprising:

a closed cylinder;

a fixed tubular member coupled to a source of fluid under pressure having a first array of orifice means for flowing said fluid into said cylinder;

a piston assembly adapted to engage and eject said article, said piston assembly slidably mounted within said cylinder and telescopically movable over said fixed tubular member from a first position, wherein said piston assembly covers a portion less than all of said first array of orifice means, thereby leaving an uncovered portion of said first array of orifice means, to a second position, wherein said first array of orifice means are uncovered, said first and second positions defining the stroke of said piston assembly, said uncovered portion of said first array of orifice means gradually increasing as said piston assembly moves through said stroke; and

means for selectively intiating fluid flow from said source of fluid, said uncovered portion of said first array of orifice means metering said fluid into said cylinder when fluid flow is initiated such that said piston assembly is forced under a preselected pressure versus stroke profile from



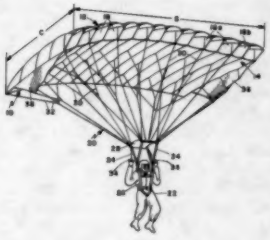
said first position to said second position to eject said article.

4,399,969

GLIDING PARACHUTE

William L. B. Gargano, Santa Ana, Calif., assignor to Edward Strong, Orlando, Fla.

Filed Dec. 31, 1980, Ser. No. 221,895
Int. Cl.³ B64D *17/02, 17/68*
U.S. Cl. 244—145 **4 Claims**



1. A flexible and inflatable gliding wing comprising aligned upper and lower flexible panels each having a generally rectangular configuration and a length to width ratio in the range of approximately 2:1 to approximately 2.85:1, the panels being connected to one another by a plurality of vertically extending airfoil-shaped ribs extending transversely across the panels at longitudinally spaced locations to define a plurality of cells so that upon inflation of the wing one adjacent set of the longitudinal edges of the panels will be vertically spaced apart to form the leading edge of the wing to permit air to flow rearwardly through the cells, the portion of the upper panel defining the upper wall of each cell having a greater longitudinal dimension than the portion of the lower panel defining the lower wall of the cell, the ribs including side ribs and a center rib between each adjacent pair of side ribs, the center ribs having greater camber height than the side ribs, the ratio of the maximum camber height of the ribs to the chord thereof being in the range of approximately 0.1:1 to approximately 0.2:1, a pair of generally triangular flexible stabilizers each having its base edge secured to, and extending downwardly from one of the side edges of the lower panel, and each stabilizer having an apex positioned at least 50% of the chord aft of the leading

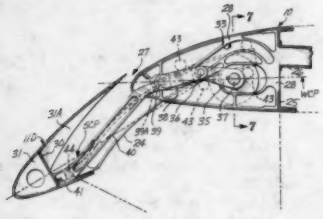
edge of the wing, and a plurality of suspension lines connected to the wing and extending downward from the wing in converging relationship to at least one point of attachment for a load, the upper ends of the suspension lines being connected to the ribs to define a plurality of longitudinally spaced and transversely extending rows of suspension lines, the suspension lines being proportioned in length so that during flight the suspension lines impart a longitudinal arcuate curvature to the wing, the ratio of the span of the wing to the vertical distance between the attachment point and the lower panel is approximately 2:1, and the attachment point is in the range of approximately 25% to approximately 45% of the chord aft of the leading edge of the wing.

4,399,970

WING LEADING EDGE SLAT

Arthur Evans, Seattle, Wash., assignor to The Boeing Company, Seattle, Wash.

Filed Nov. 13, 1980, Ser. No. 206,590
Int. Cl.³ B64C 9/24
U.S. Cl. 244—214 **10 Claims**



7. A mechanism for extending and positioning a high-lift device relative to an airfoil, comprising: a carrier track extending chordwise in said airfoil and being pivotally connected at one end to said high-lift device; means mounted to said airfoil for supportably guiding the other end portion of said carrier track for chordwise extension movement of said high-lift device relative to said airfoil; a camtrack spaced spanwise from said carrier track and fixedly mounted chordwise in said airfoil; a rotary actuator mounted in said airfoil; a linkage mechanism being in a folded arrangement during a fully retracted position of said high-lift device relative to said airfoil and interconnecting said high-lift device with said camtrack and said rotary actuator; said rotary actuator in combination with said linkage mechanism, said camtrack and said carrier track, effecting a simultaneously combined unfolding linkage extension movement of said high-life device on said carrier track from said airfoil, and a camtrack guided angle-of-incidence programming of said high-lift device relative to said airfoil; and said camtrack producing a guided force vector component to said linkage mechanism during unfolding linkage extension movement of said high-lift device, for enabling said linkage mechanism to freely operate a complete extension cycle of said high-lift device without locking up.

4,399,971

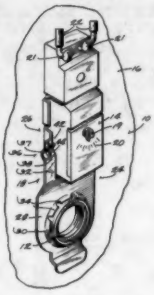
MOUNTING ASSEMBLY FOR HEATER THERMOSTAT CONTROL

George L. Fehrmann, Nashville, and Samuel M. Stubblefield, Jr., Franklin, both of Tenn., assignors to Apcom, Inc., Franklin, Tenn.

Filed Jan. 12, 1981, Ser. No. 224,278
Int. Cl.³ E04G 5/06
U.S. Cl. 248—221.3 **3 Claims**

1. An assembly for mounting a thermostat control on the outer wall of a heater tank including an external spud in which a heating element is mounted, said mounting assembly comprising

a first bracket made from a spring material and including a body having an opening adapted to lockingly fit over the tank spud, said first bracket further including a pair of laterally-spaced legs extending from said body and having a bent upper end portion adapted to apply spring pressure toward the tank outer wall when said first bracket is locked on the tank spud, each of said legs including in said upper end portion an elongated slot having an upper end; and



a second bracket carrying the thermostat control and having a pair of laterally-spaced, upstanding ears adapted to fit beneath the upper end portions of said legs, each of said ears including a nib received in a said slot for interlocking said first and said second brackets and having an upper edge adapted to engage the upper end of said slot and cooperate therewith to urge the thermostat control into firmer contact with the tank outer wall in response to upward vertical movement of said second bracket relative to said first bracket.

4,399,972

PORTABLE SUPPORT PLATFORM

Roger L. McCulloch, 2023 Michigan Ave., La Porte, Ind. 46350

Filed Apr. 13, 1981, Ser. No. 253,274
Int. Cl.³ B65D 19/34
U.S. Cl. 248—346 **4 Claims**

1. A support platform, comprising

(a) a generally rectangular unitary paperboard blank, including

(1) a rectangular top wall panel;

(2) a pair of end wall panels connected with opposite edges of said top wall panel by a pair of parallel first fold lines, respectively, said end walls having a given width;

(3) a pair of end flaps connected with said pair of end wall panels by a pair of parallel second fold lines, respectively, said second fold lines being arranged parallel with said first fold lines;

(4) a pair of side wall panels connected with the remaining opposed edges of said top wall panel by a pair of parallel third fold lines, respectively, said third fold lines being arranged normal to said first fold lines, said side wall

panels having the same width as said end wall panels; and

(5) a pair of side flaps connected with said pair of side wall panels by a pair of parallel fourth fold lines, respectively, said fourth fold lines being arranged parallel with said third fold lines, said end and side flaps being foldable about said second and fourth fold lines, respectively, to corresponding positions on one side of said top wall panel normal to said end and side wall panels, respectively, said end and side wall panels being foldable about said first and third fold lines, respectively, to corresponding positions on the same side as, and normal to said top wall panel, said side and end flaps being positioned opposite said top wall panel and in a common plane parallel with and spaced from said top wall panel, said blank in its folded condition defining a partially enclosed chamber;

(b) expansible insert means having a honeycomb configuration arranged within and completely filling said partially enclosed chamber for supporting said top wall panel, the height of said insert means being generally equal to the width of said side and end wall panels, respectively; and

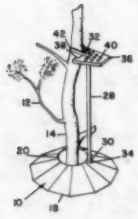
(c) means for connecting said insert means with said folded blank thereby to define the support platform.

4,399,973

CHRISTMAS TREE STAND

Robert H. Spry; Robert R. Spry, both of 513 E. Locust, Bloomington, Ill. 61701, and Gloria Koller, Rt. #2, Pearl Rd., Spring Green, Wis. 53588

Filed Aug. 12, 1982, Ser. No. 407,333
Int. Cl.³ F16M *13/00*
U.S. Cl. 248—524 **14 Claims**



1. A stand (10) for supporting a Christmas tree (12) having a trunk (14) with a butt end (16), comprising:

(a) a base (18);

(b) surfaces of the base (18) defining an upwardly opening tree well (20) adapted to receive the butt end (16) of the trunk (14) of the Christmas tree (12);

(c) a support post (28) of a selected length having a first and a second end (30, 32);

(d) surfaces of the base (18) defining an upwardly opening support post well (34) adapted to receive and hold the first end (30) of the support post (28) in an upright position, rigidly engaged in the support post well (34) in unturning relation;

(e) a trunk brace (36) having a substantially arcuate trunk engaging surface (38), adapted to engage the trunk (14) at a selected distance above the base (18) in unturning relation, the trunk brace (36) having surfaces defining a multiplicity of support post holes (40) adapted to slip over and thus engage the second end (32) of the support post (28);

(f) means to support the trunk brace (36) at a selected distance above the base (18) in rigid, unturning relation with respect to the support post (28); and

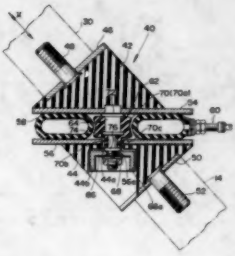
(g) a retention band (42) adapted to bias and retain the trunk (14) against the engaging surface (38).

4,399,974

ENGINE MOUNT

Hirofumi Takei, Yokosuka, Japan, assignor to Nissan Motor Company, Limited, Yokohama, Japan

Filed Dec. 10, 1981, Ser. No. 329,570
Claims priority, application Japan, Jan. 7, 1981, 56-1139[U]
Int. Cl.³ F16M *13/00*
U.S. Cl. 248—605 **12 Claims**



1. An engine mount for mounting an engine on a vehicle body, comprising:

(1) first and second elastic resilient blocks arranged to leave therebetween a certain clearance;

(2) first bracket means connecting said block to said engine, and second bracket means connecting said second block to said vehicle body;

(3) a first vibration absorber disposed in said clearance to absorb a high-frequency small-amplitude vibration which, originating from the operation of the engine, is transmitted from the engine to the vehicle body;

(4) a second vibration absorber disposed in said clearance in parallel with said first vibration absorber to absorb a low-frequency large-amplitude vibration which, originating from impacts of the road wheels of the vehicle, is transmitted from the vehicle body to the engine;

(5) said first vibration absorber comprising an annular tube of an elastic mateial filled with pressurized air;

(6) said second vibration absorber comprising:

(a) a third elastic resilient block which assumes a condition disengaged from said second block when said tube is expanded to a certain degree; and

(b) stopper means which suppresses excessive movement of said second block in the direction away from said first block;

(7) said stopper means having

(a) a bore formed in said second block, said bore being in communication with said clearance through an opening fromed in said second block, the sectional area of said bore being greater than that of said opening;

(b) a shaft about which said third block is coaxially mounted, said shaft extending from said first block toward said second block through the central opening of said annular tube and projecting at its head portion into said bore of said second block through said opening of the same; and

(c) a stopping member spacedly received in said bore of the second block and secured to said head portion of said shaft to be axially movable therewith in said bore, said stopping member having a size larger than said opening of said second block;

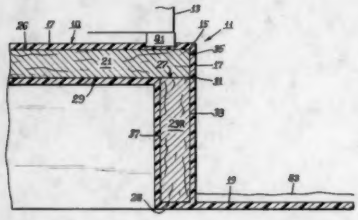
(8) said third block further comprising a larger diameter portion spacedly received in the central opening of said annular tube and a smaller diameter portion spacedly received in said opening of said second block; and

(9) said shaft being formed with two spaced circular flanges between which said third block is disposed.

4,399,975
SUPPORT STRUCTURE FOR MOUNTING HEAVY OBJECTS

Emil P. Trimarco, 6236 W. 124th Pl., Palos Heights, Ill. 60463, and Norman S. Kalish, 12948 Crescent Ct., Crestwood, Ill. 60445

Filed Jan. 12, 1981, Ser. No. 224,008
Int. Cl.³ F16M 9/00
U.S. Cl. 248—678 **20 Claims**



1. A weather-resistant support structure for the stationary level mounting of heavy objects such as air conditioner condensers and the like on a roof surface which may be sloped, comprising:

a wooden skeleton having a substantially flat top supported by a plurality of sidewalls, said sidewalls being generally normal to said flat top and having height dimensions and bottom edges formed to compensate for any slope of the roof surface upon which said structure is to rest so that the flat top is generally level,

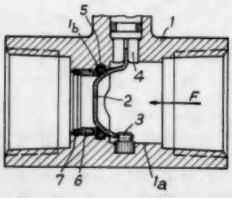
a weather-resistant lamination of a predetermined thickness entirely covering said wooden skeleton to substantially seal the same from moisture and to impart additional structural strength, and

a weather-resistant flange extending outwardly from the bottom of said sidewalls, generally parallel to the roof surface upon which said structure is to rest, so that the weight to be carried by the structure will be distributed on the roof surface generally over the entire area of said flange.

4,399,976
VALVES WITH LENTICULAR OR SPHERICAL CLOSING MEMBER

Andre Legris, Saint-Maur, France, assignor to Legris SA, Rennes, France

Filed Dec. 15, 1980, Ser. No. 216,705
Claims priority, application France, Jan. 3, 1980, 80 00075
Int. Cl.³ F16K 5/06
U.S. Cl. 251—306 **13 Claims**

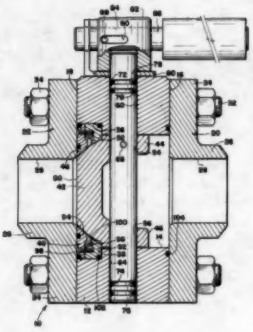


1. An improvement in a valve having a circular seal and a closing member mounted for pivoting inside a valve body, said closing member comprising a spherical surface for sealing against said circular seal wherein said circular seal is located downstream of said closing member and presents a curved portion adopting the corresponding shape of the closing member, and said valve body is provided, downstream of the closing member and of said circular seal with a bore inside of which is removably mounted an annular element against which rests the circular seal, said annular member containing vent-holes adapted to create a communication between the conduit downstream of the circular seal and a housing inside which the said seal is engaged, for an instantaneous balancing of pressures, said annular member being joined to the body via means situated on the side opposite the circular seal.

4,399,977
BALL VALVE

Charles Wheatley, Tulsa, Okla., assignor to Barton Valve Company, Inc., Shawnee, Okla.

Continuation of Ser. No. 176,037, Aug. 7, 1980. This application Jan. 18, 1982, Ser. No. 340,209
Int. Cl.³ F16K 5/06
U.S. Cl. 251—315 **5 Claims**



1. A ball valve comprising a valve body for removable installation between a pair of substantially identical oppositely disposed flanged fittings and having a fluid passageway extending therethrough, sectional valve seat means removably secured on the valve body coterminous with one end of the fluid passageway, a rotatable closure means disposed in the fluid passageway and having the outer periphery thereof in constant engagement with the valve seat means, said closure means having fluid passageway means for alignment with the fluid passageway of the valve body in one position of the closure means for providing an open position for the valve and having a closed end for alignment with the fluid passageway of the valve body in another position of the closure member for providing a closed position for the valve, and seal means removably secured between the sections of said valve seat means whereby the closure means engages the valve seat means both upstream and downstream of the seal means in the closed position of the valve and only outside of the seal means in the open position of the valve.

4,399,978
HAND TOOL WITH VARIABLE INCLINED HEAD

Charles H. Moore, R.R. 4, Robinson, Ill. 62454

Filed Feb. 26, 1982, Ser. No. 352,810
Int. Cl.³ B25C 11/00
U.S. Cl. 254—26 R **1 Claim**

1. In a carpenter's hammer or like small hand tool having an elongate handle and a tool head mounted crosswise of the handle, the improvement wherein

the tool head embodies an intermediate attachment portion of rigid metal having a pair of work portions projecting laterally from opposite sides of the attachment portion, one of said work portions being a solid butt useful in pounding;

the elongate handle being of rigid metal and containing a

longitudinally extending, axially-centered through-bore which opens through both the forward and rearward ends of the handle;

a pair of parallel spaced hinge ears integral with and projecting axially of the forward end of the handle;

the rearward end of said tool head attachment portion disposed in said space between the hinge ears; and

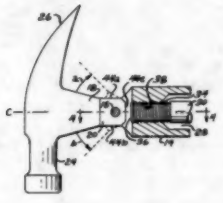
a pivot pin pivotally connecting said attachment portion to the hinge ears, the axis of said pivot pin intersecting the longitudinal axis of said tool head attachment portion and said handle through-bore at right angles thereto;

the surrounding periphery of the tool head attachment portion embodying first, second and third planar abutment faces circumferentially spaced about said axis of the pivot pin and radially spaced equidistantly from said pivot pin axis at a distance less than the separation of the pivot pin from the forward end of the elongate handle;

the through-bore of the elongate handle having a circumferentially threaded wall portion immediately behind the forward end of the elongate handle;

a rigid metal latch rod in said handle through-bore extending axially thereof;

said rod having a planar forward end disposed normal to the axis of said rod and an exteriorly threaded portion by which it is threadedly connected to the handle, said externally threaded portion of the latch rod being disposed immediately behind its forward end;



a hand grip portion fixed to and surrounding the rearward end of said elongate handle for manual grasp in use of the tool;

an externally accessible knob operatively connected to the rearward end of the latch rod beyond the handle and its hand grip portion such that when rotated in one direction the forward planar abutment end of the latch rod is drawn into the forward end of the handle bore freeing the tool head to swing on the pivot pin and when rotated in the counter direction is moved outwardly therefrom into the space between the handle hinge ears so as to positively engage that one of the abutment faces of the tool head attachment portion aligned therewith and to lock the tool head to the handle;

the threaded forward portion of the latch rod having an axial length greater than that of the threaded portion of the handle such that the latch rod remains connected to the handle both when its forward end is fully retracted into the through bore of the handle and when expanded to engage with a selected one of the abutment faces of the tool head attachment portion aligned with the axis of the through-bore;

said knob having a diameter greater than that of the elongate handle such that the tool head can be positively locked both in the positions to which the tool head is adjusted on its hinged connection to the elongate handle and to prevent slippage of the user's grip on the tool in his use thereof.

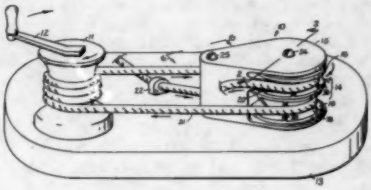
4,399,979
DEVICE FOR SELF-TAILING A CONVENTIONAL WINCH DRUM

Michael R. Adelman, 4884 MacArthur Blvd., Washington, D.C. 20007

Continuation of Ser. No. 866,915, Jan. 4, 1978, abandoned. This application Jan. 19, 1979, Ser. No. 4,840

Int. Cl.³ B66D *1/30*

U.S. Cl. 254—338 **2 Claims**



1. A device for self-tailing a winch, comprising:

a frame member having a pair of coaxial sheaves journalled thereon, a first one of said sheaves having a groove configured to securely grip a line and the second sheave having a groove configured to frictionally receive a line;

a clutch device connecting said sheaves for positively rotating said first sheave by said second sheave in at least one direction; and

means adapted to prevent rotation of at least said first sheave in the other direction, whereby a line to be hauled may be reeved in the groove of said second sheave, trained around a winch or the like then reeved in the groove of said first sheave and thereby effect self-tailing when said line is hauled by said winch to rotate said second sheave in said one direction.

4,399,980
OBSTACLE PROTECTOR MEANS

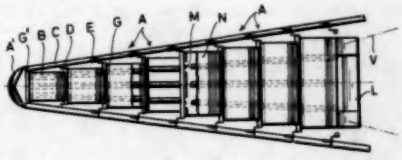
Theodorus J. M. van Schie, 's-Gravendeel, Netherlands, assignor to Staat der Nederlanden, Netherlands

Filed Jun. 23, 1981, Ser. No. 276,706

Claims priority, application Netherlands, Jun. 24, 1980, 8003653

Int. Cl.³ E01F *15/00*

U.S. Cl. 256—13.1 **6 Claims**



1. An arrangement for protecting an obstacle, the arrangement comprising a deformable spatial structure wherein a dissipation of energy is brought about a deformation resulting from a collision with a moving object, the deformable spatial structure comprising:

a straight series of segments, the segments being interconnected along a central axis lying in the direction of anticipated motion, each segment including:

at least one inverted U-shaped support member standing on the ground and positioned transversely to the central axis:

a box-like structure fastened to the U-shaped member;

a plurality of crumpling tubes disposed within the box-like structure extending in the direction of the central axis; and

a pair of flank members affixed on both sides of each

segment, the flank members having free ends slidingly overlapping the flank members of adjacent segments;

the support member of the last segment viewed in the direction of anticipated motion being fixedly secured to the ground;

a horizontal guideway parallel to said central axes disposed on the ground and receiving only the support member of the first segment to allow displacement of the first support member only in the direction of the central axis; and wherein

the segments are coupled to one another so that under lateral forces acting thereon, the deformable spatial structure behaves like a rigid girder supported at the last segment end, but is collapsible under head-on collisions along the central axis.

4,399,981

VESSEL FOR MOLTEN METAL

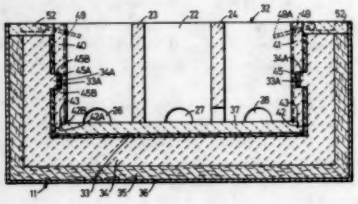
Ants Nömtak, Tegnervägen 8, S-802 28 Gävle, Sweden

Filed Sep. 28, 1981, Ser. No. 306,393

Claims priority, application Sweden, Oct. 1, 1980, 806866

Int. Cl.³ C21B *3/00*

U.S. Cl. 266—275 **4 Claims**



1. A vessel for molten metal, comprising:

a box-like inner vessel having bottom and side walls formed by rigid heat-resistant panels which are sealingly joined together along confronting edge surfaces at the inside corners defined by the bottom and side walls, and

a heat insulation covering the outer sides of the bottom and side-wall panels of the inner vessel,

wherein the improvement comprises:

the panels of the inner vessel being held together substantially exclusively by pressure exerted on them by the insulation and directed toward the interior of the inner vessel, and

the insulation including a compressed resilient layer of heat-resistant fibrous material engaging and covering the outer sides of the panels, and a box-like outer vessel integrally cast from a refractory casting compound and engaging the outer side of said resilient layer.

4,399,982

HEAVY PETROLEUM OIL PLASTICIZED, TAR BONDED TAPHOLE MIX

Francis W. Henry, Jr., Glen Burnie, Md., assignor to General Refractories Company, Bala Cynwyd, Pa.

Division of Ser. No. 144,439, Apr. 28, 1981, abandoned. This application Dec. 14, 1981, Ser. No. 330,507

Int. Cl.³ C21B *7/12*

U.S. Cl. 266—45 **6 Claims**

1. A process for plugging a blast furnace taphole comprising (1) introducing a blast furnace taphole plugging composition comprising a coal tar binder, a refractory filler and a very heavy aromatic petroleum oil, which fails to polymerize at the high heating rates experienced during normal application of the taphole mix to the taphole, into an apparatus suitable for injecting the mix into a blast furnace taphole, said heavy aromatic petroleum oil having a minimum boiling temperature of 700° F. and above and a boiling range between 700° F. and 1000° F. and being present in an amount from about 5 to about 11% by weight on a coal tar basis; (2) applying said blast furnace taphole plugging composition to the taphole via said apparatus; and (3) holding said apparatus at the furnace taphole for a time sufficient to effect plugging of the taphole.

4,399,983

APPARATUS FOR THE PRODUCTION OF LIQUID IRON, ESPECIALLY FOR DIRECTLY PRODUCING LIQUID IRON FROM ORE

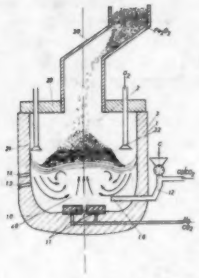
Paul Metz, Luxembourg, Luxembourg, assignor to Arbed S.A., Luxembourg, Luxembourg

Filed Mar. 5, 1981, Ser. No. 240,839

Claims priority, application Luxembourg, Mar. 5, 1980, 82227

Int. Cl.³ F27B *3/18*

U.S. Cl. 266—176 **4 Claims**



1. Apparatus for the production of liquid iron, especially for directly producing liquid iron from iron ore, comprising a metallurgical container having a bottom and an opposite open end and adapted to contain a bath of iron; a cover extending over the open end of said container and having a central opening; a tubular chute projecting upwardly from said opening for feeding iron ore onto a central portion of an iron bath in said container so that the iron ore will form a cone on a central portion of the surface of the bath while leaving an uncovered border zone around the cone on the bath surface; means for blowing oxygen onto said border zone of the bath surface; means for blowing particulate carbon into the bath below the surface thereof; and means for blowing a neutral gas from a central portion of the bottom of the container in upward direction through the bath.

4,399,984

AUTOMATIC INSTALLATION FOR THE HEAT TREATMENT OF WORKPIECES IN FLUIDIZED BEDS

Jean-Claude M. Bouchon, Poissy, France, assignor to Midland-Ross Corporation, Cleveland, Ohio

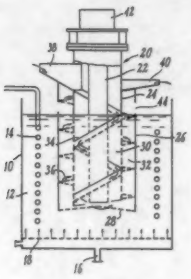
Filed Feb. 8, 1982, Ser. No. 346,530

Int. Cl.³ C21D *9/567*

U.S. Cl. 266—252 **7 Claims**

1. An apparatus for heat treating articles in a fluidized bed of heated particles, said apparatus comprising: a fluidized bed of heated particles, and a vibrating conveyor for moving said articles through said bed, said conveyor including a cylindrical member, first helical ramp means coaxial with said cylindrical member for guiding the articles into said fluidized bed, second helical ramp means coaxial with said first ramp means and said cylindrical member for guiding the articles out of said fluidized bed, at least one of said first and second ramp means being connected with said cylindrical member, a platform at least partially closing one end of said cylindrical member for receiving articles from said first ramp means, moving said articles radially, and for thereafter transferring said articles to said second ramp means, said platform being formed of material having perforations smaller than the articles being heat treated

and substantially larger than the heated particles, and means for vibrating said cylindrical member, said first and second ramp means, and said platform to cause said articles to advance



along said first ramp means onto said platform, and onto said second ramp means to thereby move said articles into and out of said fluidized bed.

4,399,985

METALLURGICAL LANCE

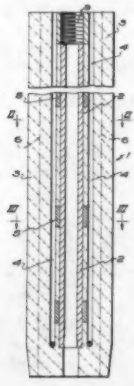
Owen Eastwood, Worksop, England, assignor to Monoconstruction Limited, England

Filed Apr. 1, 1982, Ser. No. 364,232

Claims priority, application United Kingdom, Apr. 2, 1981, 8110332; Jul. 1, 1981, 8120239

Int. Cl.³ C21B *7/16*

U.S. Cl. 266—265 **16 Claims**



1. A metallurgical lance comprising a tubular member for the passage of a gas or a mixture of gases and solids, said member being encased in a sleeve of refractory material capable of withstanding the temperature of the molten metal into which it is immersed, there being arranged around the periphery of the tubular member, and spaced therefrom, a number of longitudinal reinforcing members also encased in the refractory sleeve.

4,399,986

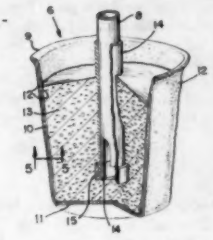
DEVICE FOR PLUGGING A TAPHOLE IN A FURNACE

William J. Collins, 7005 Madison St., Merrillville, Ind. 46410

Filed Dec. 14, 1981, Ser. No. 330,471

Int. Cl.³ C21C *5/46*

U.S. Cl. 266—272 **14 Claims**



1. A device for plugging a taphole in a furnace adapted to contain a mass of molten metal having a layer of slag thereon, said device comprising a generally tapered resilient plug, a substantially centrally disposed elongated socket fixedly secured in said plug for detachably receiving the end of a lance adapted to facilitate manipulation of the device into such a taphole, and a stop located at the inner end of said socket for limiting inward movement of the lance.

4,399,987

RESILIENT SUPPORT DEVICE

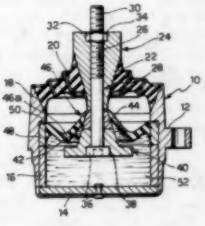
Andrea Cucelli, Milan; Gustavo Brizzolesi, Trezzano sul Naviglio, and Emilio Bossi, Gragnano, all of Italy, assignors to S.A.G.A. Societa' Applicazioni Gomma Antivibranti S.p.A., Milan, Italy

Filed Jul. 1, 1981, Ser. No. 279,420

Claims priority, application Italy, Jul. 4, 1980, 23275 A/80

Int. Cl.³ F16F *15/00*

U.S. Cl. 267—140.1 **4 Claims**



1. A resilient support device for mounting an oscillating body on a support structure, of the type including:

a tubular support body fixable to the support structure;

an attachment member attachable to an oscilliating body and connected coaxially to one end of the tubular support body;

an annular elastomeric element having its outer surface fixed to the tubular support body and its inner surface fixed to the attachment member to connect the latter to said one end of the support body, and

a fluid-dynamic damper for damping oscillations of the attachment member relative to the tubular support body, wherein the improvement consists in:

a rigid transverse wall being provided at the opposite end of the tubular support body to the attachment member;

a shank being provided on the attachment member, and extending coaxially in the tubular support body,

a transverse disk being carried at the inner end of said shank, and

an annular elastomeric diaphragm interposed between the attachment member and the transverse disk so as to be coaxial with the tubular support body and axially spaced from said annular elastomeric element, said diaphragm being connected at its inner surface to said shank and at its outer surface to the tubular support body, a first chamber being defined between said diaphragm and said transverse wall of the tubular support body, and a second chamber being defined between said diaphragm and the annular elastic element, said first chamber being filled with a damping liquid in which the transverse disk is immersed and sealed with respect to said second chamber.

4,399,988

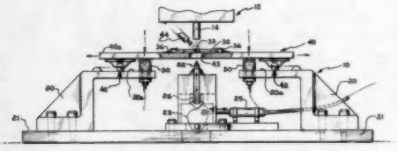
APPARATUS

George T. De Shong, Etters, Pa., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Filed Nov. 23, 1981, Ser. No. 324,131

Int. Cl.³ H05K *3/30*; B25B *11/00*

U.S. Cl. 269—8 **3 Claims**



1. Apparatus for locating a printed circuit board having a hole for receiving an electrical component in relation to an inserting element of an electrical component inserting machine comprising: a fixed anvil assembly located beneath the inserting machine, said anvil assembly including a rigid support having an upper surface, and an anvil movable past the upper surface of the support from an at rest position to a staking position in alignment with the inserting element; a circuit board holder that includes a ferromagnetic plate having upper and lower surfaces connected by a hole, means for attaching said circuit board in a fixed position on the upper surface of said plate with the component receiving hole in alignment with the hole in the plate; resilient means for supporting said plate positioned between the upper surface of the rigid support and the lower surface of the plate; and a plurality of energizable electromagnets attached to and extending above the upper surface of the support to hold said plate in a fixed position beneath said inserting element when energized, whereby the holes in said plate and said printed circuit board may be aligned with said anvil and then said plate may be depressed to engage said electromagnets.

4,399,989

SAFE GRIP SLICER FOR BAGELS, ROLLS, MUFFINS AND THE LIKE

Robert A. Baillie, 20 Montana Dr., Jackson, N.J. 08527

Filed May 13, 1981, Ser. No. 263,107

Int. Cl.³ B26D *7/02*

U.S. Cl. 269—87.2 **9 Claims**

1. Slicing apparatus comprising:

a handle;

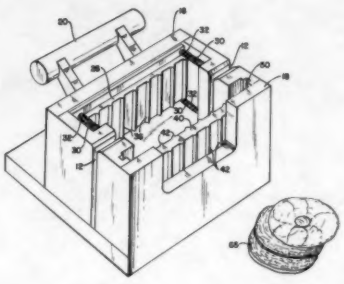
a frame providing a cavity for accepting an item to be sliced therein, and having a support rod around which said handle is arranged to pivot when in use;

a first, stationary plate within said frame for receiving one surface of the item to be sliced;

a pair of horizontally aligned guide means within said frame, extending in a direction from said handle towards said item to be sliced;

a second plate apertured to receive said guide means at opposing locations thereon, and to be supported thereby in floating relationship with respect to said frame;

a rounded surface on said handle, adapted to bear against said second plate under user control, for manually actuating said second plate towards an opposite surface of said item to be sliced, and for actuating said second plate by an extent to cause said second plate to abut against said opposite surface and to hold said one surface of said item in place against said first stationary plate;



with said rounded surface on said handle being positioned to bear substantially only against a lower portion of said second plate when said handle is pivoted, in giving said second plate a rotational actuation about said rounded edge and on said guide means, in abutting against said opposite surface of said item to be slice; and

means adaptable to receiving a cutting blade, also manually controlled by said user, for slicing said item at a location intermediate said opposite item surfaces when held in place by said cooperating action of said first and second plates.

4,399,990

UNIVERSAL SUCKER

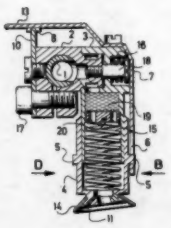
Jaroslav Jiruse, Blansko, Czechoslovakia, assignor to ZVS Adamovske strojirny, Koncernovy podnik, Prague, Czechoslovakia

Filed Sep. 28, 1981, Ser. No. 305,988

Claims priority, application Czechoslovakia, Oct. 15, 1980, 6970-80

Int. Cl.³ B65H *3/08*

U.S. Cl. 271—90 **4 Claims**



1. A universal sucker for a paper feeder unit which comprises:

a support tube having adjustably mounted thereon a carrier having a support piece, on said carrier is swivelly mounted a body fitted with a shiftable cylindrical piston having an axis and a working area, said piston being provided with projections, a control element mounted on said body having means for engaging said projections and

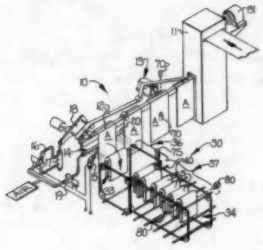
means for engaging said support piece to fix the swivel position of said body.

4,399,991

MECHANISM FOR STACKING AND ACCUMULATING STACKS OF FLAT FLEXIBLE ARTICLES

Palmer B. Everall, Jr., and Jack R. Lowery, Sr., both of Lancaster, S.C., assignors to Springs Mills, Inc., Fort Mill, S.C.

Filed Sep. 25, 1981, Ser. No. 305,593
Int. Cl.³ B65H 29/54
U.S. Cl. 271—175 8 Claims



1. Mechanism for stacking and accumulating a plurality of stacks of predetermined numbers of flat flexible articles, such as pillowcases and like products, sequentially received therein, such as from a machine fabricating such articles; said mechanism comprising:

longitudinally-extending frame means defining an entrance end and an exit end for said mechanism, and defining at said entrance end an article stacking section having a longitudinal dimension for effecting article stacking, and defining at said exit end a stack accumulating section having a longitudinal dimension for containing a plurality of stacks;

a plurality of bar holders positioned in said mechanism for sequentially receiving a predetermined number of the articles in draped-over superimposed position on each of said bar holders at said entrance end of said mechanism to form separate stacks of the articles;

selectively-driven conveying means movably mounted on said frame means in said stacking and accumulating sections and carrying each of said bar holders in spaced-apart relation for selective movement of each of said bar holders longitudinally through said mechanism (1) from said entrance end through said stacking section to said accumulating section, (2) incrementally through said accumulating section to said exit end in a plurality of incremental longitudinal distances each of which is less than the longitudinal dimension through said stacking section, and (3) back to said entrance end; and

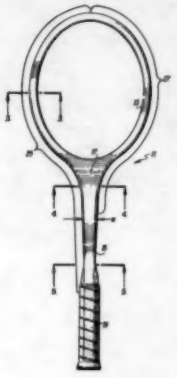
control means connected with said conveying means for (1) counting the articles sequentially received on an empty one of said bar holders at said entrance end of said mechanism, (2) actuating said conveying means after counting a predetermined number of articles and deactuating said conveying means after said stacked bar holder has been carried through said stacking section to said accumulating section and each of the previously stacked bar holders has moved forward one of the incremental distances in said accumulating section and an empty one of said bar holders has been carried to said entrance end of said mechanism, and (3) sensing a stacked bar holder arriving at said exit end of said mechanism and stopping operation of said mechanism until at least said bar holder at said exit end of said mechanism has been emptied of the stack of articles.

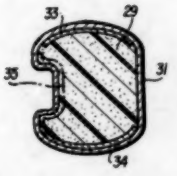
4,399,992

STRUCTURAL MEMBER HAVING A HIGH STRENGTH TO WEIGHT RATIO AND METHOD OF MAKING SAME

Robert P. Molitor, South Hadley, Mass., assignor to Questor Corporation, Tampa, Fla.

Filed Mar. 10, 1980, Ser. No. 128,543
Int. Cl.³ A63B 49/10
U.S. Cl. 273—73 F 4 Claims





1. In a racket frame having a head, throat and handle, an improved construction wherein said frame comprises

a core consisting of a mixture of syntactic foam and a blowable non-syntactic foam;

a fiberglass outer shell bonded to and substantially covering said core; and

the racket frame further comprising high strength fiber material comprising a ribbon of graphite material woven together by aramid fibers located about at least a portion of said racket frame.

4,399,993

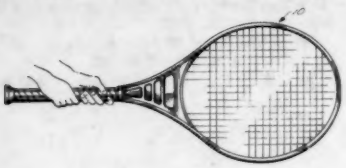
TWO HANDED TENNIS RACKET

Arthur K. Melin, 457 Country Club Dr., San Gabriel, Calif. 91778

Continuation of Ser. No. 55,322, Jul. 6, 1979, abandoned. This application Aug. 17, 1981, Ser. No. 293,386
Int. Cl.³ A63B 49/08
U.S. Cl. 273—73 R 3 Claims

1. A tennis racket comprising a frame having a head connected to a handle shaft through a throat section so as to have an overall length of 30 to 32 inches and a weight of 15 to 21 ounces, said head having strung surface of 80 to 130 square inches, and a grip located on the handle portion of the racket, said grip having an overall length of at least 3 adult handwidths such that the racket can be gripped in the middle of

the grip by one hand have sufficient space to place the other hand either above or below the first hand to permit



the racket to be grasped in a two-handed grip when hitting either a forehand or a backhand shot.

4,399,994

GOLF AID

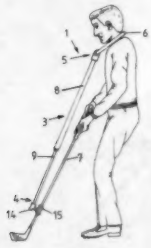
James Hourihan, Cabra Rd., Thurles, Co. Tipperary, Ireland

Filed Sep. 22, 1981, Ser. No. 304,529

Claims priority, application Ireland, Oct. 15, 1980, 2134/80; Jul. 20, 1981, 1633/81

Int. Cl.³ A63B *69/36*

U.S. Cl. 273—191 R 13 Claims



1. A device for constraining an elongated game club to swing through an arc of predetermined radius, the device comprising: a neck engaging member defining the center of the arc of motion of an elongated game club and adapted to engage a player's neck, and an elongated club engaging member one end of which terminates in the neck engaging member and the other end being adapted to engage the club, the club engaging member in combination with the neck engaging member defining the radius of the arc of motion of the club.

4,399,995

CHESS GAME AUTOMATIC CONTINUATION CIRCUIT

Dieter Tünnerhoff, Walramstrasse 29, 5750 Menden, Fed. Rep. of Germany

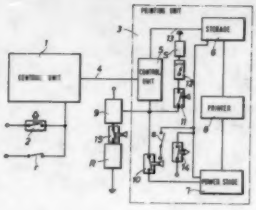
Filed Jun. 15, 1981, Ser. No. 273,388

Claims priority, application Fed. Rep. of Germany, Jun. 14, 1980, 3022405

Int. Cl.³ A63F *3/02*

U.S. Cl. 273—237 2 Claims

1. Apparatus for selectively enabling fully automatic play of a chess game including a data processing unit having a start input terminal and operable to automatically calculate chess moves and generating a print command signal as a result thereof, a manually operable start switch connected to said start input terminal for producing an activation signal to said data processing unit for initiating said calculations corresponding to only one move, a memory storage device for storing each calculated move and a printer unit responsive to said print command signals for printing coordinates of each calculated move, comprising: a switching device having a first portion responsive to said print command signal and a second portion connected to said start input terminal of said data processing unit for generating an additional activation signal to said start input terminal in response to each of said print command signals



whereby each print command signal activates said data processing unit to calculate an additional chess move.

4,399,996

PRACTICE BAT

Gary C. Boyce, 2253 Shawnee Trail, Okemos, Mich. 48864

Continuation of Ser. No. 949,618, Oct. 10, 1978, abandoned. This application Oct. 9, 1980, Ser. No. 195,329

Int. Cl.³ A63B *69/40*

U.S. Cl. 273—26 B 6 Claims

1. A practice bat for establishing a swing coordination as between hands in a two-handed baseball swing movement comprising:

a head portion having a substantially uniform diameter and elongate shape at one end of said bat;

a handle portion having a substantially uniform diameter at the other end of said bat and extending a predetermined distance along said bat;

a tapered portion of said bat extending from said head to said handle portion; and

a resilient means separating said handle into two separate grip portions and normally biasing said grip portions to coaxial alignment with said head and said tapered portions.

4,399,997

SEALING BUSH UNIT FOR SEALING RECIPROCATING MACHINE PARTS

Erich Bröken, Im Moddenfelde 24, D-4902 Bad Salzuflen 1, Fed. Rep. of Germany

Filed May 24, 1982, Ser. No. 381,513

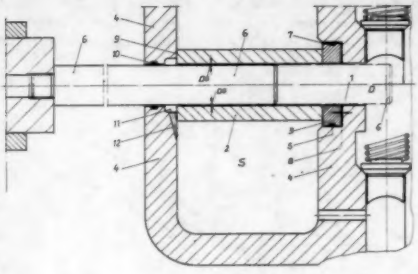
Claims priority, application Fed. Rep. of Germany, May 29, 1981, 3121317

Int. Cl.³ F16J *15/48*; F04B *21/08*

U.S. Cl. 277—12 15 Claims

1. A sealing bush unit for sealing a reciprocating machine part, particularly a plunger of a fluid-displacing pump having a pump housing with suction and pressure sides, the sealing bush unit comprising an annular bush having an axis, a radially inner surface with an inner diameter exceeding an outer diameter of a plunger so as to form a radial gap therebetween, a radially outer surface arranged so that a working pressure acts upon said radially outer surface over a part of its axial length and thereby said bush radially displaces toward the plunger, and two end faces of which one end face faces toward a suction zone and the other end face faces toward a pressure zone, said

one end face being flat and extending normal to said axis of said bush to provide axial abutment of the latter; and a pressing ring



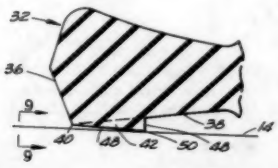
arranged adjacent to the other end face of said bush with an axial play relative to the pump housing.

4,399,998

SELF-VENTING SEAL LIP

Dennis L. Otto, Malvern, Ohio, assignor to The Timken Company, Canton, Ohio

Filed Dec. 28, 1981, Ser. No. 334,740
Int. Cl.³ F16J 15/32
U.S. Cl. 277—134 16 Claims



1. In combination with a circular wear surface, a seal unit for isolating a region behind the seal unit, said seal unit comprising: a mount spaced from the wear surface and an elastomeric seal lip of annular configuration attached to the mount and extended over the wear surface such that it can flex toward and away from the wear surface, the seal lip having a narrow sealing edge at which it normally contacts the wear surface, with the contact being continuous for the full circumference of the sealing edge, the lip further being capable of distorting toward the wear surface when the pressure within the region isolated by the seal unit is increased, and pivot means on the seal lip for contacting the wear surface when the seal is distorted by an increase in pressure within the isolated region, the distortion and contact being such that the seal lip pivots about the pivot means and lifts the sealing edge from the wear surface to vent the isolated region.

4,399,999

SEGMENTED ANNULAR SEAL FOR MISSLE LAUNCH TUBE

Donald C. Wold, Sunnyvale, Calif., assignor to Westinghouse Electric Corp., Pittsburgh, Pa.

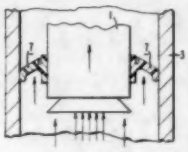
Filed Apr. 8, 1982, Ser. No. 366,459
Int. Cl.³ F16J 15/10, 15/32; F41F 3/04
U.S. Cl. 277—199 7 Claims

1. A seal segment to be disposed in a circular array of seal segments to form a seal for a large annular space, said seal segment comprising:

a base portion, which fits a cylindrical surface;

a seal portion which extends from said base so as to form an acute angle between a high pressure side of said seal portion and said base;

said seal portion having longitudinal margins with diagonally opposed steps that overlap when one seal segment is



abutted against another to form the circular array of seal segments; and

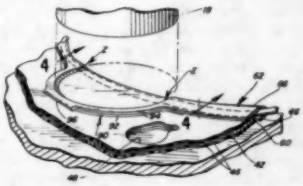
a groove extending across a low pressure side of said seal portion at the juncture of said seal portion and said base portion.

4,400,000

HEAD GASKET ASSEMBLY FOR DIESEL ENGINES

John C. Moerk, Jr., Buffalo Grove, Ill., assignor to Felt Products Mfg. Co., Skokie, Ill.

Filed Apr. 15, 1982, Ser. No. 368,564
Int. Cl.³ F16J 15/12
U.S. Cl. 277—235 B 6 Claims



1. In a head gasket assembly for positioning between the head and block of an internal combustion engine and wherein said block defines a combustion cylinder and said head defines a bore in which a precombustion chamber is disposed, said precombustion chamber being positioned partially to overlie said combustion cylinder and to discharge into said combustion cylinder,

said head gasket assembly comprising a multi-layered main gasket body defining a combustion opening adapted to be disposed in-line with a said cylinder and defining a plurality of other apertures spaced away from said combustion opening,

a fire ring secured to said body adjacent the periphery of said combustion opening and comprising a metallic annulus having legs lying generally parallel to said main gasket body, a wire ring disposed between said legs and within the periphery of said combustion opening and a precombustion tab extending from one of said legs outwardly of said combustion opening and being adapted to underlie and support a precombustion chamber so that the precombustion chamber partially overlies said combustion opening, said precombustion chamber being adapted to overlie and to intersect said wire ring at two spaced zones of intersection,

the improvement comprising an auxiliary sealing element underlyig the precombustion tab and overlying said wire ring, said auxiliary sealing element comprising a main body portion generally complementary to the peripheral edge of the precombustion tab and lying against the lower surface thereof, and having integral sealing tabs, one of the sealing tabs underlying one of said legs at a first of said two spaced zones of intersection, and the other sealing tab

underlying said leg at the second zone of intersection, whereby when said gasket assembly is disposed between a said head and block and is placed under load, a more effective and consistent seal between the fire ring and the associated precombustion tab around and adjacent said precombustion tab and an engine head and a precombustion chamber will be obtained.

4,400,001

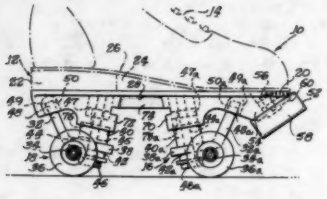
ROLLER SKATE

Gordon K. Ware, Chicago, Ill., assignor to Chicago Roller Skate Company, Chicago, Ill.

Filed Jun. 29, 1981, Ser. No. 278,855

Int. Cl.³ A63C *17/02*

U.S. Cl. 280—11.28 **3 Claims**



1. A soleplate for a roller skate of the type including a truck assembly securable to the soleplate by a fastener assembly, said fastener assembly including an elongated shank member having a threaded end portion, said fastener assembly further including as components a head at an opposite end of said shank member and a nut engageable with the threaded end portion, the soleplate comprising: a unitary member having a top surface and a bottom surface, said unitary member including an embossment integral with and depending from said bottom surface, said embossment including an aperture through a bottom end thereof for receiving said shank member in a position depending from the soleplate, said aperture including axially aligned first and second portions respectively of first relatively large predetermined and second relatively small predetermined transverse dimensions and a seat between said first and second portions, at least one of the components having transverse dimensions less than said first and greater than said second predetermined transverse dimensions, said aperture further including a slot substantially transverse to said first and second portions and communicating therewith axially above said seat for passing one of said components and said shank member to said first and second portions during assembly of the fastener assembly with the soleplate, said one component having a side surface, said first portion having a surface engageable with said surface of said one component for preventing rotation of said component, said one component being movable through said slot, into said first portion and thence axially toward said second portion for engagement with said seat when fully assembled with said soleplate, tightening of said nut on said threaded portion causing the shank member to be non-rotatably and positively secured to said soleplate.

4,400,002

OPERATOR MOUNTING STEP FOR TRACK-LAYING VEHICLES

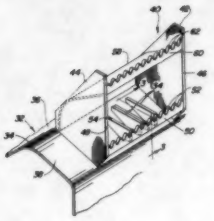
Dean J. Stillmunkes, Dubuque, Iowa, assignor to Deere & Company, Moline, Ill.

Filed May 11, 1981, Ser. No. 262,092

Int. Cl.³ B60R *3/04*

U.S. Cl. 280—164 A **3 Claims**

1. In a vehicle mounting step structure formed in part by an inverted V-shaped track tensioner cover plate having an apex extending longitudinally within an area circumscribed by an endless track of a track-laying vehicle and further including a longitudinally extending foot-engageable strap joined to the cover plate and disposed within a step housing having vertical, longitudinally spaced end walls joined to the cover plate at opposite ends of the strap and having a top inclined downwardly and inwardly from a location vertically above the strap to the cover and joined to the end wall and the cover, the improvement comprising: said top having an upturned outward lip located vertically above the strap so as to form a



secondary foot-engageable support, said strap being elevated above the cover plate and joined to the end walls, which serve to join the strap to the cover plate, whereby material carried to the top of the step housing slides inwardly down the top and material which happens to find its way into the housing slides outwardly on the cover plate beneath the strap.

4,400,003

DEMOUNTABLE BICYCLE FRAME

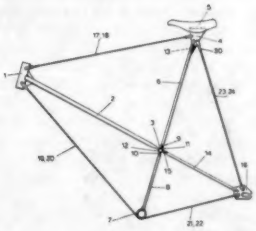
Cornelis F. de la Haye, TM Katwijk aan Zee, Netherlands, assignor to Technic Design One N.V., Curacao, Netherlands Antilles

Filed Feb. 20, 1981, Ser. No. 236,228

Claims priority, application Netherlands, Feb. 21, 1980, 8001054

Int. Cl.³ B62K *15/00*

U.S. Cl. 280—278 **6 Claims**

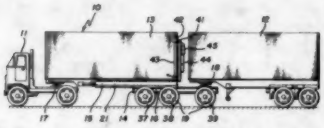


1. A bicycle frame comprising a back fork, a steering head sleeve, a pedal shaft sleeve, a saddle support, continuous bar means extending from said saddle support to said pedal shaft sleeve, pivot means located intermediate the end of said continuous bar means, an oblique tube extending from the steering head sleeve to said pivot means substantially in alignment with the back fork, said back fork extending to said pivot means, and tensioning wires peripherally connecting the ends of said continuous bar means, the back fork and the steering head sleeve, said pivot means and the ends of each said oblique tube and back fork comprising demountable connection means consisting of male and female members, disengageable upon release of tension in the tensioning wires.

4,400,004
TANDEM TRAILER SYSTEM

Gerard Arguin, Spencer, Mass., assignor to Arguin Trailer Frame, Inc., Spencer, Mass.

Filed Aug. 20, 1981, Ser. No. 294,775
Int. Cl.³ B62D *53/08*
U.S. Cl. 280—468 **6 Claims**



1. Trailer system to be drawn behind a highway tractor and behind which can be drawn a second trailer unit, comprising:

(a) a cargo container,

(b) a chassis on which the container is mounted, the chassis having a first upper portion and a second lower portion, the second portion being longitudinally slidable relative to the first portion from a first position generally co-extensive with the first portion to a second position where it extends beyond the end of the cargo container, the first upper portion of the chassis consisting of a pair of I-beams held in spaced, parallel relationship for attachment to the container, the second lower portion of the chassis consisting of a similar pair of I-beams connected together in spaced, parallel relationship and underlying the first portion, so that the undersurface of the lower flange of each I-beam of the first portion is supported on the upper surface of the upper flange of the corresponding I-beam of the second portion, a plurality of guides being fixed to the I-beams of the second portion and embracing the lower flanges of the I-beams of the first portion,

(c) a first attaching means associated with the front end of the container for connection to the highway tractor,

(d) a second attaching means associated with the second portion of the chassis, so that, when the second portion is in the second position, another trailer can be attached to it,

(e) wheels mounted on the said second portion of the chassis,

(f) a pair of locking pins mounted on the second portion for transverse movement to engage apertures in the first portion when the second portion is in the first or the second position and to hold the first and second portions against relative sliding movement when in the first or second position, the wheels being provided with pneumatic brakes, the locking pins being provided with a pneumatic actuator cylinder, and

(g) a selector valve provided to connect a source of pressure air selectively to the brakes or the cylinder, so that the locking pins are released when the brakes are locked and the pins are engaged when the brakes are free.

4,400,005
TRACTOR-TRAILER CONNECTOR MEANS WITH RETRACTABLE COUPLING PINS

Russell L. Losh, Rensselaer, Ind., assignor to Talbert Manufacturing, Inc., Rensselaer, Ind.

Filed Jul. 31, 1981, Ser. No. 289,055
Int. Cl.³ B62D *53/06*
U.S. Cl. 280—423 B **11 Claims**

1. A mechanism for releasably connecting a load-carrying frame with a tractor in which the load-carrying frame is supported at its rear by wheels rotatably mounted on an axle about which the forward end portion of the frame may be raised and lowered and in which the tractor is provided with a fifth wheel, said mechanism comprising:

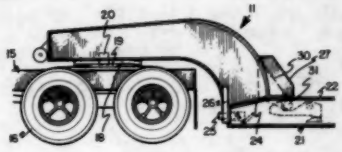
a gooseneck between said tractor and said frame, said gooseneck having a horizontally disposed arm adapted to be connected at its forward end portion to said fifth wheel, and an inclined portion extending from said arm to form a rearward end portion thereof;

a tail member attached centrally to said rearward end portion and defining an engaging keeper;

a pair of stirrups connected to said rearward end portion, each of said stirrups being provided with an opening, and said stirrups being spaced apart and on each side of said tail member;

the front section of said load-carrying frame having an aperture disposed on the upper side thereof;

claw means mounted on said front section proximate said aperture, said claw means including a hook-shaped engaging member pivotally mounted to said frame to extend through said aperture for attachment and detachment to said keeper;



a pair of dowels slidably mounted to project horizontally from said front end of said load-carrying frame, said dowels being spaced apart and laterally situated from said claw means, with said pair of dowels being in alignment so as to engage and disengage the openings of said stirrups;

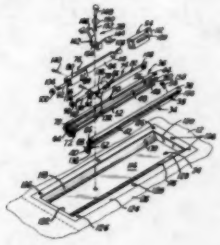
means for activating said pair of dowels for engagement and disengagement of the same from said stirrups, and

means connected to said frame for activating said claw means to couple and uncouple with said keeper.

4,400,006
GOLF BAG PROVIDED WITH A RETRACTABLE ROLLING ASSEMBLY

Sam Larkin, 254 Beach 140th St., Belle Harbor, N.Y. 11694

Continuation-in-part of Ser. No. 214,129, Dec. 8, 1980, Pat. No. 4,382,612. This application Sep. 21, 1981, Ser. No. 303,903
Int. Cl.³ B62B *3/02*
U.S. Cl. 280—646 **19 Claims**



1. A gold bag comprising:

a container;

a retractible rolling assembly coupled to said container, said rolling assembly including a pair of support arms pivotally coupled to said container and extendable to an angular orientation with respect to said container, and an axle section pivotally coupled to a distal end of each support arm, said axle sections being extendable inwardly toward each other so as to lie in a coaxial relationship with each other, said support arms being substantially parallel in a retracted folded position and diverging from each other in an extended position;

pivot means for moving said rolling assembly between the extended position and the retracted folded position, said pivot means including an elbow joint coupling each of said axle sections to the distal end of its respective support arm to permit inward folding of each axle section adjacent and parallel to its respective support arm;

a shaft laterally extending from each axle section for supporting a detachable wheel;

locking means for securely retaining said rolling assembly in each of said extended and folded positions, and said locking means including coupling means for releasably locking together joined ends of said axle sections in their extended position, said coupling means simultaneously operating to lock said support arms in their extended position; and

said support arms including U-shaped channels, distal ends of said channels being downwardly oriented, and a distal edge of each said channel abutting against its respective axle section to provide a limiting stop to prevent the unfolding of the axle section with respect to its respective support arm.

12. A golf bag comprising:

a container;

a retractable rolling assembly coupled to said container, said rolling assembly including a pair of support arms pivotally coupled to said container and extendable to an angular orientation with respect to said container, an axle section pivotally coupled to a distal end of each support arm, said axle sections being extendable inwardly toward each other so as to lie in a coaxial relationship with each other;

pivot means for moving said rolling assembly between an extended position and a retracted folded position; and

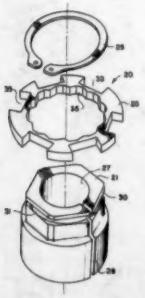
locking means for securely retaining said rolling assembly in each of said extended and folded positions, said locking means including coupling means for releasably locking together joined ends of said axle sections in their extended position, said coupling means including a keyhole provided at a joining end of one axle section, a mating key provided at a joining end of the other axle section, and a sleeve slidable over the interconnected joined ends of said axle sections to securely retain said key positioned in said keyway.

4,400,007

METHOD AND STRUCTURE FOR ADJUSTING CASTER OR CAMBER

William E. Ingalls, Longmont, Colo., assignor to Thomas W. O'Rourke, Boulder, Colo.

Filed Dec. 28, 1981, Ser. No. 334,782
Int. Cl.³ B62D *17/00*
U.S. Cl. 280—661 **10 Claims**



1. A ball joint bushing assembly adapted to fit within a vehicle axle and suspension assembly member and to engage at least one positioning lug defined on the axle and suspension assembly member, the bushing assembly comprising,

a bushing body having at least a portion thereof defined by a cylindrical outer surface disposed around an axis through the bushing body, an inner bore adapted to receive a ball joint shaft defined through the bushing body around an inner bore axis, the outer surface axis and inner bore axis being defined by two lines, the bushing body further having a plurality of locating projections defined around the bushing body adjacent an end thereof, the locating projections being positioned to be spaced from the positioning lug with the bushing body carried in the axle and suspension assembly member,

a lock ring having defined centrally therethrough an opening in the form of a plurality of indents positioned around the periphery of the central opening and configured to engage the bushing body locating projections in a plurality of angular positions between the bushing body and lock ring, the lock ring further having defined at the outer edge thereof a plurality of indentations sized and positioned to engage the axle and suspension assembly member positioning lug with the lock ring fitted to the bushing body at the locating projections thereof, and

securing means releasably secured to the bushing body and positioned to maintain the bushing body and the lock ring as a single assembly;

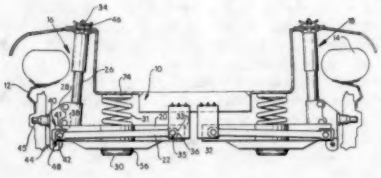
whereby the bushing body may be positioned in the the axle and suspension assembly member with the inner bore therethrough receiving a ball joint shaft, the bushing rotated within the axle and suspension assembly member to provide desired camber and caster relationships, the lock ring placed on the bushing body and engaging the locating projections thereof at the central opening indents and the positioning lug at the outer edge indentations to preclude rotation of the bushing body assembly.

4,400,008

INDEPENDENT REAR WHEEL SUSPENSION WITH A SPRING SEAT FIXED TO A CONTROL ARM

Manfred Rumpel, Birmingham, Mich., assignor to Ford Motor Company, Dearborn, Mich.

Filed Dec. 24, 1981, Ser. No. 334,333
Int. Cl.³ B60G *7/00*
U.S. Cl. 280—666 **11 Claims**



1. An independent rear wheel suspension for a vehicle comprising:

a chassis;

a wheel support member adapted to rotatably mount a wheel;

an upwardly extending telescopic shock absorber having its lower end rigidly secured to said wheel support member;

means pivotably connecting the upper end of said shock absorber to said chassis;

transversely extending front and rear control arms pivotably connected at their inboards ends to said chassis and at their outboard ends to said wheel support member;

a spring seat means integrally formed with one of said arms and seating a spring means interposed between said spring seat means and said chassis.

4,400,009

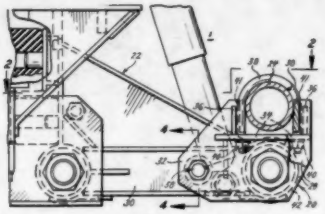
STABILIZED AXLE SEAT FOR CANTILEVER MOUNT

John E. Raidel, Rte. 9, Box 400-M, Springfield, Mo. 65804

Continuation-in-part of Ser. No. 110,778, Jan. 9, 1980, Pat. No. 4,331,348, and Ser. No. 113,472, Jan. 21, 1980, Pat. No. 4,278,271, and Ser. No. 113,710, Jan. 21, 1980, Pat. No. 4,309,045. This application Jun. 5, 1981, Ser. No. 270,607

Int. Cl.³ B60G 5/00

U.S. Cl. 280—687 16 Claims



15. In vehicle suspension assembly for mounting a vehicle chassis from a pair of spaced axles, the suspension including a load bearing spring element generally disposed between the axles and mounted therebetween in cantilever fashion, an axle bracket rigidly secured to each axle, the suspension including a pair of torque rods, one end of each torque rod being pivotally connected to the suspension, and at least two spaced apart bushings mounting each axle seat from the other end of each torque rod, said bushings thereby stabilizing each axle and limiting its pivotal movement about the suspension while permitting limited oscillation of each axle with respect to the suspension.

4,400,010

AIR BAGS IN MOTOR VEHICLES

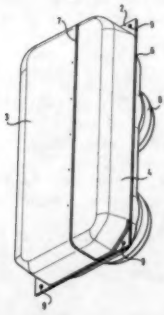
Michael Stütz, Schwäbisch-Gmünd, and Jürgen Mitzkus, Mutlangen, both of Fed. Rep. of Germany, assignors to REPA Feinstanzwerk GmbH, Alfdorf, Fed. Rep. of Germany

Filed Mar. 24, 1981, Ser. No. 247,215

Claims priority, application Fed. Rep. of Germany, Mar. 25, 1980, 3011463

Int. Cl.³ B60R 21/10

U.S. Cl. 280—732 10 Claims



1. Device for the storage of air bags in motor vehicles, which are provided for the protection of persons in the vehicle, comprising a box-shaped housing disposed in a vehicle for receiving a deflated, folded air bag therein being attachable to an inner wall of the vehicle, and filling means disposed in said housing for inflating the air bag with gas during accidents to prevent or reduce injuries causing the air bag to expand along given horizontal and vertical directions, said housing being formed of substantially rigid material and having yieldable walls, a planar base plate for attachment to the vehicle, said base plate having parallel edges, and a cover having a parting line formed therein parallel to said edges of said base plate defining two cover shells being movably hinged directly along said edges of said base plate and being swingable out of the given horizontal and vertical directions, said cover shells being connected to each other in the vicinity of said parting line by an intentionally breakable point being openable upon a pressure rise in the air bag.

4,400,011

VEHICLE BODY CONSTRUCTION

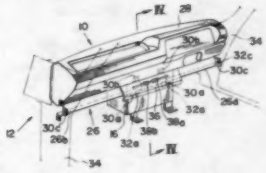
Yoshio Matsuno, Yokohama, Japan, assignor to Nissan Motor Co., Ltd., Yokohama, Japan

Filed Mar. 18, 1981, Ser. No. 244,892

Claims priority, application Japan, Mar. 31, 1980, 55-43394[U]

Int. Cl.³ B60R 21/04

U.S. Cl. 280—748 8 Claims



1. A vehicle body construction, comprising:

a dash panel defining an engine compartment and a passenger compartment at the opposite sides thereof;

a car heater core having a casing which is securely connected to said dash panel and located within said passenger compartment;

side panels formed at the opposite side sections of said dash panel, respectively; and

an elongate knee restraining member so disposed as to be strikable with knees of a vehicle occupant during a vehicle collision, said knee restraining member being securely connected at one end thereof with one of said side panels and at the other end thereof with said car heater core casing.

4,400,012

STEERING COLUMN COVERING SHELL STRUCTURE

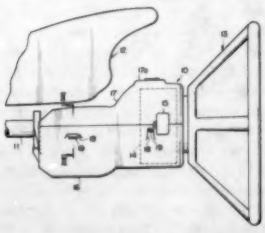
Hidehiro Otsuka, Tokyo, Japan, assignor to Nissan Motor Company, Limited, Yokohama, Japan

Filed Aug. 31, 1981, Ser. No. 298,192

Claims priority, application Japan, Sep. 16, 1980, 55-131542[U]

Int. Cl.³ B62D 1/18

U.S. Cl. 280—777 2 Claims



1. A steering column covering shell structure for a steerable

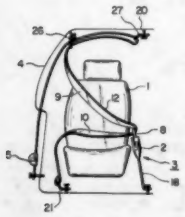
vehicle having a body structure, a steering column secured to the body structure and axially collapsible when subjected to axial load, and an instrument panel secured to the body structure, said shell structure comprising two shell members consisting of lower and upper shell members which are disconnectably held together to form therebetween a hollow space for allowing said steering column to axially extend in part therethrough, the upper shell member having an upward protrusion spaced apart rearwardly from said instrument panel, one of said shell members having a stress raising wall portion bounded by a continuous groove formed in one of said shell members, said stress raising wall portion being formed with an aperture located inside said groove and a plurality of radial slots radially extending outwardly from said aperture, and angularly spaced apart from each other about said aperture, said steering column having mounted thereon an electric switch assembly including a casing secured to the steering column and enclosed within said upper and lower shell members, said raised wall portion being secured to the steering column by means of a rigid fastening element passed through said aperture and clamped to said stress raising wall portion and said casing.

4,400,013

SAFETY SEAT BELT SYSTEM

Hironobu Imai, Chigasaki, Japan, assignor to NSK-Warner K.K., Tokyo, Japan

Filed Jun. 18, 1981, Ser. No. 274,770
Claims priority, application Japan, Jun. 24, 1980, 55-88275[U]
Int. Cl.³ B60R *21/10*
U.S. Cl. 280—801 **2 Claims**



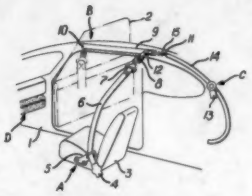
1. In a safety seat belt system for a vehicle including a shoulder webbing, an upper end portion of the shoulder webbing being adapted to be releasably wound up on a retractor, but, when worn by an occupant, said shoulder webbing being extended to restrain the torso of the occupant, the improvement comprising said upper end portion of the webbing being formed narrower than the rest of the webbing, and said system further including at least two guide members for threadingly guiding said webbing between said retractor and the relevant shoulder of said occupant without allowing said narrower end portion of the webbing to extend over the occupant, a lap webbing which is continuous with said should webbing thereby forming a lap shoulder continuous webbing, a first one of said guide members being located at an upper portion of a central pillar of the vehicle and said second one guide members being spaced from the first guide member in a direction substantially perpendicular to the longitudinal axis of the vehicle and being secured on the inner wall of the roof of the vehicle.

4,400,014

COUPLING DEVICE FOR CONNECTING A DRIVE ELEMENT TO A BELT TRANSFER MEMBER IN A PASSIVE VEHICLE OCCUPANT RESTRAINT BELT SYSTEM

Juichiro Takada, 3-12-1 Shinmachi, Tokyo, Japan 105

Filed Nov. 10, 1981, Ser. No. 319,897
Int. Cl.³ A62B *35/02*
U.S. Cl. 280—804 **4 Claims**



1. In a passive vehicle occupant restraint belt system having a belt transfer member engaging the belt and received for movement along a guide rail between a restraint location in which the belt is held in a configuration for restraining the occupant and a release location in which the belt is held in a configuration for releasing the occupant and an elongated drive element driven by a drive device in response to opening and closing movements of the vehicle door and adapted to transmit motion to the belt transfer member from the drive device, the improvement comprising a fitting fastened on the end portion of the drive element and having a shaft portion extending coaxially with the end portion of the drive element and at least one annular flange portion of a diameter substantially greater than the diameter of the shaft portion projecting generally radially from the shaft portion, a generally U-shaped receptacle on the transfer member having a width large enough to accept the shaft portion of the fitting and substantially less than the diameter of the flange portion and having oppositely located openings receiving parts of the flange portion of the fitting with said parts of the flange portions engaging edges of the openings that lie transverse to the axis of the guide rail, and a generally U-shaped retainer leaf spring received and held in place in the receptacle and having spaced-apart resilient leg portions straddling the flange portion and partly overlying the shaft portion of the fitting, the leg portions being resiliently deflectable to permit the fitting to be pushed into the receptacle into a position in which the leg portions retain it therein.

4,400,015

RETRACTORS EMBEDDED IN SIDE FRAME MEMBERS OF CARS

Nobuyuki Ryu, Toyota, Japan, assignor to Toyota Jidosha Kogyo Kabushiki Kaisha, Toyota, Japan

Filed Jun. 3, 1981, Ser. No. 270,010
Claims priority, application Japan, Jul. 29, 1980, 55-107279[U]
Int. Cl.³ B60R *21/10*
U.S. Cl. 280—807 **6 Claims**

1. An arrangement of a seat belt retractor in a car comprising:

right and left frame members, said frame members comprising a part of the car body;

a floor member disposed above said frame members and having at least one retractor embedding hole therein;

at least one seat belt retractor fitted into said embedding hole and located beneath the floor member, the retractor having (i) a webbing mechanism therein for winding up and unwinding a seat belt webbing, (ii) a mechanism frame for supporting a webbing mechanism, and (iii) a cover for covering the webbing mechanism, the cover being pro-

vided with a belt outlet therein for a seat belt webbing to pass through during winding up and unwinding;

wherein the retractor cover is detachably secured to the mechanism frame by a first securing means, and the mech-

anism frame is secured to the floor member by a second securing means, such that the mechanism frame can be separated from the floor member without the retractor cover becoming detached from the mechanism frame.

4,400,016

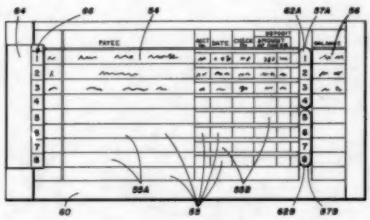
ACCOUNTING APPARATUS AND METHOD

Wayne M. Tippets, 2933 N. Casa Tomas, Phoenix, Ariz. 85016

Filed Jun. 10, 1980, Ser. No. 158,076

Int. Cl.³ B42D *11/00;* **B41L** *3/04*

U.S. Cl. 283—66 R **1 Claim**



1. A disbursements accounting apparatus, comprising:

at least one instrument having at least a first designated area and other information printed on an upper side thereof so that the name of a payee and the amount of said instrument can be imprinted within said first designated area;

first duplicating means at least selectively in communication with a lower surface of said instrument for transferring information recorded upon said first designated srea to a surface behind said instrument;

said first duplicating means being located directly behind said first designated area;

a plurality of removable strips each having a second designated area on an upper surface thereof disposed to respectively record information transferred by a specific one of said first duplicating means;

a second duplicating means at least selectively in communication with a lower surface of said strip directly behind said second designated area for transferring information recorded upon said second designated area to a surface behind said strip;

at least one journal card having a plurality of sequential third designated areas individually disposed to record information transferred by one of said second duplicating means onto an upper surface thereof;

retaining means for securing said first, one of said second and one of said third designated areas in alignment so that an inscription on said first designated area also produces images on said ones of said second and third designated areas;

said retaining means comprising adhesive means coupled to said individual strips and to said journal so that individual ones of said second and third designated areas are aligned for releasably coupling said designated strips to a surface;

said retaining means further comprising a substantially rigid backing member;

said retaining means including a first post member coupled to an interior portion of an upper surface of said backing member;

said retaining means provided with said journal card defining an aperture disposed to engage said post member so that translation and rotation of said journal card are prevented when so engaged;

said retaining means having said clamp for clamping a portion of each of said instrument and said journal card to said backing member;

said retaining means also including said post member having identification means for permitting identification of individual ones of said plurality of third designated areas.

4,400,017

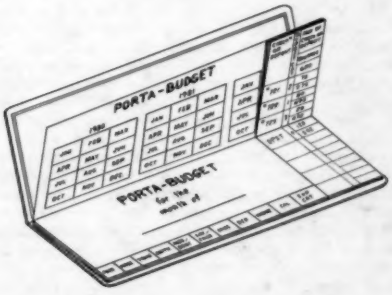
INTEGRATED BUDGET AND CHECK RECORD BOOK

Russell G. Pendergrass, Rte. 4, Mont Pelia Rd., Martin, Tenn. 38237

Continuation-in-part of Ser. No. 240,553, Mar. 4, 1981. This application Jun. 10, 1981, Ser. No. 272,100

Int. Cl.³ B42D *12/00*

U.S. Cl. 283—66 A **21 Claims**



1. A register for recording budget items and check items comprising:

(a) a first plurality of sheets having longitudinal lines on both sides thereof and transverse lines, perpendicular to said longitudinal lines, for defining columns for entry of budget items, different categories of budget items identified on said first plurality of sheets,

(b) means for securing said first plurality of sheets for movement about a central axis in book-like fashion;

(c) a second plurality of sheets having longitudinal lines on both sides thereof and transverse lines, perpendicular to said longitudinal lines, for defining columns for entry of check items, at least one of said columns on each of said second plurality of sheets for entry of indicia identifying one of said categories of budget items on said first plurality of sheets and another column for identifying a check number,

(d) means on said first plurality of sheets for identifying said check numbers on said other columns of said second plurality of sheets,

(e) said securing means securing said second plurality of sheets for movement about said central axis in book-like fashion,

(f) said first plurality of sheets having a width along said

central axis at least twice as great as the width of said second plurality of sheets, and

(g) said first and second plurality of sheets each movable independently of one another about said central axis.

4,400,018

PIPE COUPLING

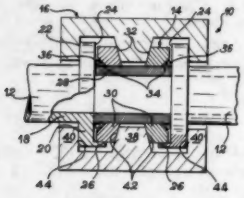
Claude Abbes, St. Etienne; Christian Rouaud, Bourg Saint Andeol; Robert Forges, Bollene, and Raymond de Villepoix, Donzere, all of France, assignors to Commissariat a l'Engergie Atomique & Socitet Brachier et Fils, Paris, France

Filed Nov. 13, 1980, Ser. No. 208,231

Claims priority, application France, Dec. 3, 1979, 79 29657

Int. Cl.³ F16L *21/06*

U.S. Cl. 285—31 **8 Claims**



1. A pipe coupling comprising two flanges which can be fixed to the ends of the pipes and a tightening device which bear on the flanges to sealingly connect the same, wherein the tightening device comprises an extensible member located between the end front faces of the flanges in such a way that said member can be fitted and removed without modifying spacing between said front faces and defining a passage providing a communication between the pipes, said tightening device further comprising at least one movable member controlling the increase of length of the extensible member to make it sealingly bear against the front faces of the flanges, the movable member further having terminal portions bearing on the rear face of the flanges to prevent the moving apart of said flanges during the increase of length of the extensible member, wherein the extensible member comprises at least two elements which move with respect to one another, each of them having a conical mating surface and the movable member comprises an intermediate portion having two opposite conical surfaces which bear against the conical mating surfaces so as to move the two elements of the extensible member away from one another when the movable member is radially displaced towards the axis of the flanges under the action of the tightening device wherein the extensible member also comprises a tubular member, whose internal diameter is substantially equal to the internal diameter of the flanges in order to define the said passage, the two movable elements being slidingly mounted on the tubular member in order to bring an O-ring into tight contact with the corresponding flange during the elongation of the extensible member.

4,400,019

MULTILAYER PIPE JOINT

Benant E. Fruck, The Woodlands, Tex., assignor to Unisert Systems, Inc., Houston, Tex.

Filed Apr. 22, 1981, Ser. No. 256,492

Int. Cl.³ F16L *59/16, 25/00, 47/02, 21/02*

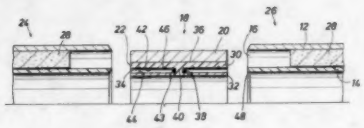
U.S. Cl. 285—55 **26 Claims**

1. A ring-shaped member for sealingly joining lengths of pipe having an outer casing, an inner plastic pipe, and an annulus formed between said outer casing and said plastic pipe, comprising:

a metallic outer band for fitting engagement between said casing and said plastic pipe at adjacent end sections of two lengths of said pipe,

an inner plastic band connected to and positioned radially inward of said metallic band and having a first surface for encompassing the external diameter surface of said plastic pipe,

sealing means adjacent said plastic band and adapted for engagement with said plastic pipe for sealing fluid within said pipe, and



said metallic outer band having a design thickness sufficient to withstand the maximum anticipated radial and tangential forces caused by pipeline fluid pressure independent of said outer casing.

4,400,020

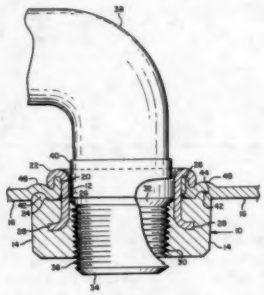
PRESSURE TANK CONNECTOR

Russell D. Keller, P.O. Box 382, Clackamas, Oreg. 97015

Filed Aug. 10, 1981, Ser. No. 291,821

Int. Cl.³ F16L *41/00, 5/00*

U.S. Cl. 285—204 **20 Claims**



1. A pressure tank apparatus comprising:

a connector fitting means for sealing an opening in the wall of a pressure tank surrounded by an outwardly extending flange portion of the wall, and for coupling an external fluid conduit connector to the interior of said tank;

said fitting means including a fitting body positioned inside said tank inwardly of the tank wall portion surrounding the flange portion and spaced inwardly from said flange portion toward the interior of the tank and having a passageway therethrough with internal threads for coupling to said conduit connector;

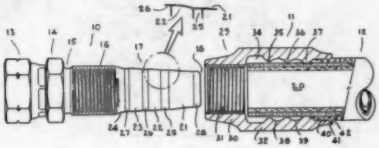
a sleeve of harder material than the fitting body attached to said body surrounding said threaded passageway and extending outwardly from one side of the body to a free end, said free end extending through the opening in the tank wall and bending over the flange portion surrounding the periphery of said opening to clamp the fitting means to the tank; and

gripping means for preventing said body from rotating relative to said tank wall by engagement with the tank wall.

4,400,021
REUSABLE TYPE HOSE END FITTING

Frederick R. Duffield, Mount Kuring-Gai, Australia, assignor to Frederick Duffield Pty. Limited, Mount Kuring-Gai, Australia

Filed Aug. 6, 1981, Ser. No. 290,281
Claims priority, application Australia, Aug. 19, 1980, PE5117
Int. Cl.³ F16L *33/22*
U.S. Cl. 285—247 **10 Claims**

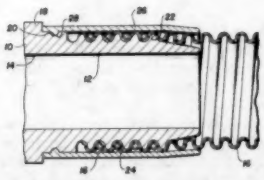


1. In a reusable-type hose end fitting having a through-bored stem portion for location in part within the bore of a hose, and a ferrule portion for location about an end portion of the hose, the stem portion having a first zone which is formed with a male screw thread and a second zone which locates within the bore of the hose when the fitting is secured to the hose end, the ferrule portion having a first zone which is formed with a female screw thread which is engageable with the male thread on the stem portion and a second zone which locates about the second zone of the stem portion to define a generally annular space in which the hose wall is located when the fitting is secured to the end portion of the hose; the improvement which is characterized in that the second zone of the stem portion is formed with at least three tapered regions which taper convergently toward the end of the stem portion, in that adjacent tapered regions are separated by a land with a 'ength in the axial direction of the stem portion which is less than the length of the adjacent tapered regions, and in that the ferrule portion is formed in its second zone with at least two annular buttresses which are spaced apart in the axial direction of the ferrule portion by a distance approximately equal to the spacing between the lands of the stem portion and which are so disposed that, as the stem portion is advanced into the ferrule portion, each land advances in an axial direction past at least one of the buttresses.

4,400,022
TUBE CONNECTOR

Fred Wright, Chester, N.J., assignor to Simmonds Precision Products, Inc., Tarrytown, N.Y.

Filed Dec. 22, 1980, Ser. No. 219,139
Int. Cl.³ F16L *33/20*
U.S. Cl. 285—256 **1 Claim**



1. An end connecto. for convoluted extruded plastic tubes having outer and inner surfaces in which:

said end connector includes a connecting end, and a nipple end which has an outer diameter which is greater than the normal inner surface diameter of said plastc tube;

said end connector includes a radially extending shoulder between said connecting end and said nipple end;

a U-shaped valley in the outer surface of said nipple end of said connector near said shoulder;

an outer swage sleeve means having a smooth inner surface;

said swage sleeve includes a ridge on its inner surface near one end which mates with said U-shaped valley in said end connector when said one end is adjacent said shoulder on said nipple end of said connector;

a continuous spring means;

said spring means being fitted axially over the exterior surface of said plastic tube and having an axial length which is less than said nipple end of said connector;

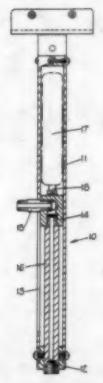
said swage sleeve means being fitted axially over said spring means; said nipple end of said connector having a irregular outer surface in the axial direction formed by risers and valleys which form screw threads with the same pitch as said convoluted plastic tube and an end portion adjacent said formed threads which has a decreasing outer diameter, said nipple end being fitted into one end of said plastic tube with said plastic tube secured radially between said nipple risers and said swage sleeve and between said nipple and said spring means with said spring means of less diameter than said risers on said nipple end;

whereby said outer swage sleeve means forces said spring means into said valleys on said nipple end thereby securing said plastic tube to said nipple end between said spring and said valleys in said nipple end of said connector and between said risers and said swage sleeve with said ridge on said swage sleeve means secured in said U-shaped valley in said connector end against removal.

4,400,023
SUSPENSION UNIT FOR A POWER TOOL

Robert S. Clarke, Arnott, England, assignor to Lucas Industries Limited, Birmingham, England

Filed Jul. 15, 1981, Ser. No. 283,621
Claims priority, application United Kingdom, Aug. 29, 1980, 8028011
Int. Cl.³ F16L *39/04, 27/00*
U.S. Cl. 285—302 **5 Claims**

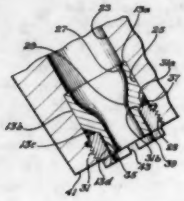


1. A suspension unit for a power tool comprising first and second members telescopically engaged one within the other, air supply means for said tool and for resisting relative rotation of said members, a spring unit acting between the members to draw the one member within the other, a supporting bracket secured to the other member whereby the suspension unit in use can be hung from a support, and means on the one member whereby a power tool can be secured thereto.

4,400,024
NOZZLE RETAINING RING WITH CRUSHED O-RING

Frank C. Ratcliff, Midland, and Edward M. Galle, Friendswood, both of Tex., assignors to Hughes Tool Company, Houston, Tex.

Filed Jul. 31, 1981, Ser. No. 288,712
Int. Cl.³ F16L *19/00, 55/00;* E21B *10/18*
U.S. Cl. 285—356 5 Claims



1. In an earth boring bit of the type having at least one passage containing a nozzle for discharging drilling fluid, the improvement comprising in combination:

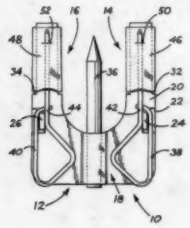
a retaining ring secured in the passage and having a bore encircled by an upper rim, the upper edge of the bore contacting a tapered section formed on the nozzle for securing the nozzle in the passage; and

an elastomeric seal deformed between the nozzle tapered section, the wall of the passage, and the upper rim of the retaining ring.

4,400,025
LEADER-TYING VISE DEVICE

Robert R. Dennison, 2220 SW. Troy, Portland, Oreg. 97219

Filed Nov. 28, 1980, Ser. No. 211,190
Int. Cl.³ D03J *3/00*
U.S. Cl. 289—17 8 Claims



1. A vise device for holding ends of lines to facilitate tying them together comprising

a U-shaped base having two spaced-apart leg portions and a connecting web,

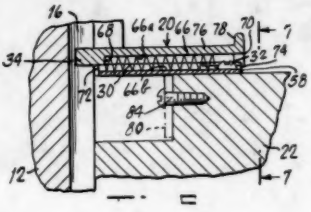
a lever associated with each leg portion extending generally along the length of the leg portion, pivotally supported between its ends on the leg portion, and having one end adjacent the distal end of the leg portion and an opposite depressible end which is spared from said base, and

an elastomer expanse for each lever snugly encircling the lever and the lever's associated leg portion in a region located between where the lever is pivotally supported and the lever's said one end and operable resiliently to urge said one end of the lever toward the distal end of the leg portion.

4,400,026
TILT LATCH FOR WINDOW SASH

John M. Brown, Jr., Brentwood, Tenn., assignor to Alcan Aluminum Corporation, Cleveland, Ohio

Filed Oct. 2, 1980, Ser. No. 193,308
Int. Cl.³ E05C *1/04*
U.S. Cl. 292—175 7 Claims



1. A tilt latch for a window sash, comprising

(a) a base member mountable on a sash, having a bottom with an upwardly facing surface and opposed first and second end edges, and spaced parallel sides projecting upwardly from the bottom to define therewith an upwardly opening, open-ended channel, facing parallel grooves being respectively formed in said sides;

(b) a slide member disposed in said channel for endwise sliding movement relative to the base member, and having opposed first and second ends respectively adjacent the first and second end edges of the bottom of the base member, and opposed side flanges extending from the first end toward the second end and respectively received in said grooves, the slide member further having, at its first end, a nose receivable in a window frame to prevent tilting of the sash relative to the frame; and

(c) resilient biasing means acting between the base member and the slide member for urging the slide member in a locking direction toward an extended position in which the nose projects beyond the first end of the base member so as to be received in the window frame;

(d) said slide member including a depending stop projection at the second end of the slide member for interferingly engaging the second end edge of the base member bottom to arrest movement of the slide member in the locking direction at the extended position, and

(e) said slide member further including a portion, extending between the lateral flanges and said second end so as to space the second end away from the flanges, and disposed to enable the stop projection to be moved manually upward above the second end edge of the base member bottom and thereby to release the slide member for movement in the locking direction beyond the extended position.

4,400,027
RECESSED WINDOW LOCK

Abraham S. Nahon, 1026 Arboretum Rd., Wyncote, Pa. 19095

Filed Feb. 2, 1981, Ser. No. 230,888
Int. Cl.³ E05C *19/18*
U.S. Cl. 292—288 5 Claims

1. In a locking device adapted to seat within openings provided in a window construction, the combination of

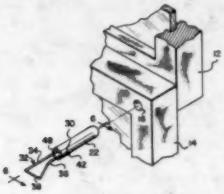
a barrel having a locking means at one end thereof,

the locking means comprising an end recess in the barrel, the recess being defined by cylindrical sidewalls and a generally flat bottom, and an opening through the sidewall in communication with the recess,

the barrel being positioned to be recessed entirely into the window construction; and

a key adapted for releasable engagement with the locking means to alternately engage and disengage the barrel, the key comprising a first leg and a second leg, the second leg

comprising a bent tooth, the tooth being adapted to be removably inserted into the opening, and the first leg being longer than the second leg, and



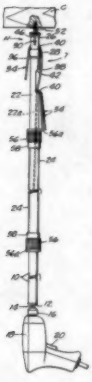
the first leg terminating endwardly in a positioning finger, the positioning finger being adapted to contact the recess bottom; whereby the barrel may be removably inserted into a portion of the window construction.

4,400,028

REMOTE DRIVING TOOL WITH TUBULAR LOCK FEATURE

James R. Conrad, 1631 Grandview, Glendale, Calif. 91201

Filed Apr. 21, 1981, Ser. No. 256,077
Int. Cl.³ A47F *13/06*
U.S. Cl. 294—19 R **18 Claims**



1. Hand held, remote driving tool for driving a rotatable working head such as a lag bolt and hanger wire insertion head, at a distance otherwise beyond the reach of the tool operator, said tool comprising a rigid axially elongated tubular driver member adapted for coupling to a power drill, and a rigid, axially elongated tubular driven member adapted to carry said rotatable working head at the driven member remote end for driving by said drill, said driven member at its near end being interfittable with said driver member at a predetermined locus of coextension; cooperating axial sections on said driver and driven members at said predetermined locus, said cooperating sections being relatively configured to bind said members selectively within said locus in a predetermined axially aligned and interfitted condition of said members and in a manner normally tending to pivoting release from binding of the members relative to each other in response to side loading forces on one or both of said members in the use of the tool; and skirt means extending beyond the outer of said members defining a skirt extension thereon, said skirt extension being in engagement with the inner of said members circumferentially beyond said predetermined locus against release of said members in pivoting response to side loading forces.

4,400,029

DEVICE FOR REMOVING WEEDS

Dominic J. Delpidio, 13 Hallmark Dr., Woburn, Mass. 01801

Filed Oct. 5, 1981, Ser. No. 308,377
Int. Cl.³ A01B *1/18*
U.S. Cl. 294—50.9 **12 Claims**

1. A device for extracting weeds comprising:
an elongated blade having a cutting edge at one end;
an elongated support, said blade being affixed to one end of said support;
a blade handle at the other end of said support, said elongated blade being longitudinally concave;
reinforcing means for said blade;
clamp means for engaging said elongated blade, said clamp means being substantially flat;
an elongated lever parallel to said elongated support and extending from said clamp means to the upper end of said elongated support;
a clamp handle at the upper end of said lever, the lower edge of said clamp handle adjacent the lower edge of said blade handle;
means forming a pivot for said lever and supported by said support;
a spring means normally tensioning said clamp toward said blade; and
a foot bar extending from either side of the lower portion of said blade support, said foot bar being perpendicular to said blade support;
wherein said clamp means, lever, and clamp handle are of a single-unit construction.

4,400,030

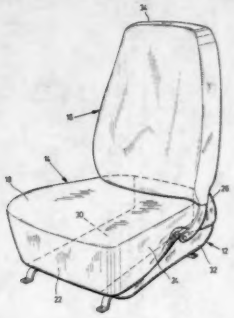
SEAT COVERS

Walter F. Maruzzo, Oakville, and Herman DeBoersap, Burlington, both of Canada, assignors to Design Dynamics Limited, Ontario, Canada

Filed Jul. 24, 1981, Ser. No. 286,439
Int. Cl.³ A47C *31/10*
U.S. Cl. 297—219 **8 Claims**

1. A seat cover for a seat part of an automobile seat having an upstanding backrest part, said seat part having top, bottom, side, front and rear surfaces, said seat cover comprising an upper portion of relatively non-elastic seat material to cover the top surface of the seat part and terminating in a defined edge on a rear extension thereof, front and side portions of elastic material extending downwardly from the upper portion of relatively non-elastic seat material to extend over the front and side surfaces of the seat part, a band portion of elastic material extending between the side portions of elastic material for positioning around the rear surface of the seat part, the

band portion of elastic material being unattached to the upper portion to provide an opening between the band portion and said defined edge, said seat cover being installable without opening said band or removing said backrest by said band being stretchable so that the seat cover can be installed on the



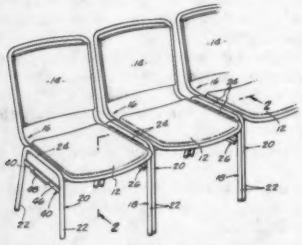
seat part by sliding said backrest through said opening so that when in place on the seat part the band is then stretched across the rear surface of the seat part, and a flap portion of elastic material extending beneath the seat part between the front and the rear, and means for securing the flap portion so as to be stretched between the front portion and the defined edge.

4,400,031

INTERLOCKING CHAIR

Edward J. DeDecker, Fountain Valley, Calif., assignor to Virco Mfg. Corporation, Los Angeles, Calif.

Filed Mar. 12, 1981, Ser. No. 243,046
Int. Cl.³ A47C *3/04*
U.S. Cl. 297—239 **4 Claims**



1. In a chair construction of the type having a seat portion and a backrest portion and also having a supporting frame, including first and second generally U-shaped frame members disposed on opposite sides of the seat portion, each said frame member having a pair of downwardly extending spaced apart leg members interconnected by a bight portion, the improvement comprising:

(a) first interlocking means adapted to be releasably interlocked together with a second interlocking means provided on an adjacent identically configured chair disposed proximate the first U-shaped frame member, said first interlocking means comprising a female side bar member, substantially Z-shaped in cross-section, interconnecting the leg members of the first U-shaped frame member and including generally vertically disposed first planar section having an elongated aperture provided therein including an interconnected substantially horizontally extending central portion and an interconnected second downwardly depending generally vertically disposed planar section spaced apart from said first planar section; and

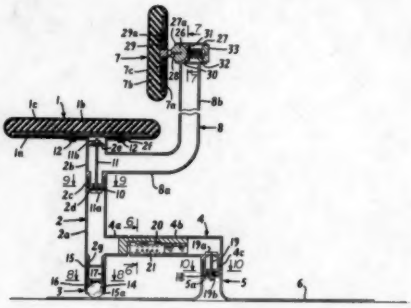
(b) second interlocking means adapted to be releasably interlocked together with a first interlocking means provided on an adjacent identical chair disposed proximate the second U-shaped frame members, said second interlocking means comprising a male side bar member, substantially Z-shaped in cross-section, interconnecting the leg members of the second U-shaped frame member and including a substantially horizontally extending central portion and a generally vertically disposed spaced apart first and second planar sections, said first planar section having an outwardly extending locking element including a central section adapted to be closely received within the central portion of the aperture provided in the female side bar member of an adjacent chair and including end portions adapted to be closely received in the end portions of the aperture provided in said female side bar member, said male and female side bar members of a first chair being adapted to engage the bight portions of said first and second U-shaped frame members of a second identically configured chair when said first and second chairs are vertically stacked one on top of another with said second planar sections being adapted to engage a portion of the bight portions of said first and second U-shaped frame members of said second chair.

4,400,032

ECCENTRICALLY ROTATABLE CHAIR

Harry R. dePolo, 480 Park Ave., New York, N.Y. 10021

Continuation-in-part of Ser. No. 893,685, Apr. 5, 1978, abandoned. This application Nov. 19, 1979, Ser. No. 95,450
Int. Cl.³ A47C *3/18*
U.S. Cl. 297—349 **19 Claims**



1. A chair comprising a base, a central pivot post projecting up from said base and defining a vertical axis of rotation, said base extending 360° around said pivot post, an upright support member spaced radially from said axis, telescopically extendible means coupling said upright support member with said central pivot post for rotation of said upright support member about said axis through an angle of 360° by rotation of said coupling means about said pivot post, and for limited movement of said upright support member toward and away from said central pivot post by telescopic extension or contraction of said coupling means, while maintaining said upright support member in an upright position, said telescopically extendible coupling means comprising two relatively movable parts and antifriction means between said two parts to provide for free movement of said parts relative to one another, a seat mounted at the upper end of said upright member, and single rolling support means at the lower end of said upright support member and rolling on said base upon rotation of said upright support member about said central pivot post and upon movement of said upright support member toward or away from said central pivot post, said rolling support means being capable of rolling in all directions on said base and comprising antifriction bearing means at the lower end of said upright

support member to support said upright support member and seat on said base, said upright support member being supported vertically solely by said single rolling support means and being maintained in an upright position by said telescopically extendible coupling means.

4,400,033

SEAT WITH A BACK REST AND ARM REST

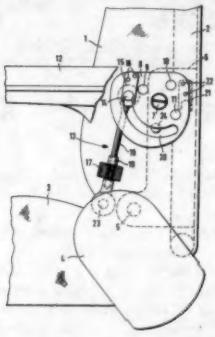
Helge Pietsch, Detmold-Lobbruch, Fed. Rep. of Germany, assignor to Gebr. Isringhausen, Lemgo, Fed. Rep. of Germany

Filed Sep. 26, 1980, Ser. No. 190,928

Claims priority, application Fed. Rep. of Germany, Sep. 24, 1979, 7927079[U]

Int. Cl.³ A47C 7/54

U.S. Cl. 297—417 **2 Claims**



1. A seat comprising a back rest, at least one arm rest, a seat frame, a pivotal attachment between the back rest and the seat frame about which the inclination of the back rest is adjustable, a pivotal attachment between the arm rest and the back rest about which the arm rest is pivotable upwards for movement from a position of use to an out of use position in which the arm rest is in the plane of the back rest, the pivotal attachment of the arm rest comprising a parallelogram linkage having four shafts, including a shaft that pivotally connects the back rest to the seat frame, a shaft that pivotally attaches the arm rest to the back rest, a shaft for pivotally connecting a tie rod at one end thereof to the seat frame, and a spindle carried by the other end of the tie rod, the arm rest in its position of use engaging the spindle and said arm rest having a fastener joined thereto which is releasably attached to said spindle for normally fixing said arm rest in the down position relative to said back rest, a pivotable plate also joined to said arm rest and having an arcuate slot formed therein, the spindle being guided for movement within said arcuate slot, said plate being mounted about the pivotal attachment of the arm rest to the back rest and being movable with said arm rest, said slot in which said spindle is received limiting the movement of said arm rest relative to said back rest, and clamping means joined to said plate and engageable with said back rest for releasably supporting the arm rest in the out of use position.

4,400,034

COAL COMMINUTION AND RECOVERY PROCESS USING GAS DRYING

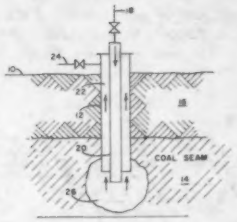
Ju-Nam Chew, Dallas, Tex., assignor to Mobil Oil Corporation, New York, N.Y.

Filed Feb. 9, 1981, Ser. No. 232,618

Int. Cl.³ B02C 19/00; E21C 41/04

U.S. Cl. 299—5 **11 Claims**

1. An improved process for comminuting coal wherein the coal is treated with an effective amount of a solvent selected from the group consisting of a basic aqueous solution and methanol, the improvement comprising first contacting said coal with a drying gas and continuing to contact said coal with said drying gas for a time sufficient to fracture at least a portion



of said coal by the absorption of moisture from the coal thereby enhancing comminution.

4,400,035

PROCESS FOR THE EXTRACTION OF THICK COAL SEAMS

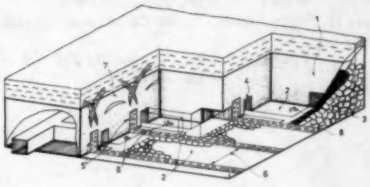
Karoly Barsi; Hugo Salamon; Andras Solymos; Jozsef Takacs, and Istvan Toth, all of Tatabanya, Hungary, assignors to Tatabanyai Szenbanyak, Tatabanya, Hungary

Filed Apr. 6, 1981, Ser. No. 251,356

Claims priority, application Hungary, Apr. 15, 1980, 907/80

Int. Cl.³ E21C 41/04

U.S. Cl. 299—11 **8 Claims**



1. A process for the extraction of thick coal seams which are divided into extraction blocks, horizontally and/or vertically, comprising bounding each of the extraction blocks by a stowing pillar so no air circulates between the extraction blocks, said pillars being interspaced at a distance wherein stress zones created thereby are in contact with one another, and said pillars are set up according to the direction of advance of extraction by advancing the cavity of the stowing pillar having a roof level within the coal seam which is higher than the level of the roof of the extraction space which is formed at the bottom of the extraction block, backfilling the cavity and then extracting the block by block caving.

4,400,036

CORNER-CUTTING MINING ASSEMBLY

John A. Bradley, San Antonio, Tex., assignor to the United States of America as represented by the U.S. Department of Energy, Washington, D.C.

Filed Jul. 1, 1981, Ser. No. 279,391

Int. Cl.³ E21C 27/24

U.S. Cl. 299—86 **5 Claims**

1. A corner-cutting mining assembly comprising:

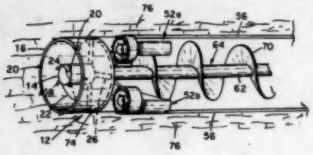
a cylindrical support shaft;

a primary rotary cutter fixedly mounted on one end of said support shaft for cutting a cylindrical bore hole in mined material coaxial with said support shaft when the latter is rotated about its longitudinal axis and advanced into said material by movement along its longitudinal axis;

a support frame comprising (1) a hub rotatably mounted on said support shaft adjacent said primary cutter, and (2) four support arms evenly spaced apart from one another

circumferentially of said hub and projecting radially outward therefrom beyond the perimeter of said bore hole;

four secondary rotary cutters respectively mounted on said support arms for rotation about axes parallel with the longitudinal axis of said support shaft, said secondary cutters being disposed between said support arms and said primary cutter, said secondary cutters having identical



diameters less than that of said primary cutter and cutting, when rotated, corner-forming grooves in the wall of said bore hole cut by said primary cutter, whereby said primary and secondary cutters together cut a hole having a quadrilateral cross-sectional shape;

means for rotating said secondary cutters; and

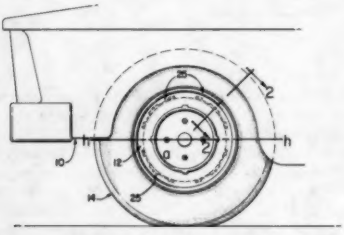
a screw conveyor rotatably mounted on said support shaft on the side of said support frame remote from said cutters.

4,406,037

WHEEL STABILIZING DEVICE

Herbert H. Gentry, 12451 Russell Cir., Garden Grove, Calif. 92643

Filed Jul. 9, 1981, Ser. No. 281,570
Int. Cl.³ B60B *13/00*
U.S. Cl. 301—5 BA **5 Claims**



1. A wheel-stabilizing device in combination with a vehicle wheel, comprising:

a vehicle wheel having an annular rim;

a plurality of stabilizing means attached to said rim in spaced relationship to each other, wherein together said stabilizing means define an elastic mass that traverses inwardly and outwardly from the spinning axis of the wheel relative to the inertia imparted by the rotating wheel;

each of said stabilizing means comprising:

a resilient member secured to said rim and adapted to flex outwardly from the fixed point thereof; and

a mass attached to at least one end of said resilient member;

wherein said resilient member comprises an elongated, flat, leaf-spring member having oppositely disposed free ends, said leaf spring being secured intermediate said free ends; and wherein said mass comprises:

a first weight member attached to one free end; and

a second weight member attached to the opposite free end, whereby the free ends will bend outwardly together as said wheel rotates about the spinning axis thereof;

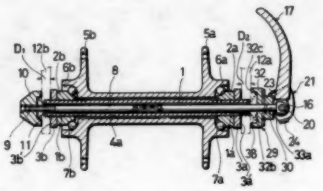
means for attaching said stabilizing means to said wheel; and means for limiting the outward movement of said elastic mass.

4,400,038

QUICK-RELEASE TYPE HUB FOR BICYCLES

Mikio Hosokawa, Osaka, Japan, assignor to Maeda Industries, Ltd., Osaka, Japan

Filed Aug. 5, 1981, Ser. No. 290,337
Claims priority, application Japan, Aug. 6, 1980, 55-108524
Int. Cl.³ B60B *27/02, 35/00*
U.S. Cl. 301—111 **8 Claims**



1. A quick-release type hub for bicycles comprising

a stationary tubular hub axle for rotatably supporting a hub shell,

a first and a second lock nuts each mounted on opposite end sections of said axle, respectively,

a spindle, which is longer than said axle, extending through said axle, and projecting at opposite ends out of said axle,

said spindle being axially slidable with relative to said axle, and having a threaded end section on which an adjusting nut is mounted, and a non-threaded end section which is formed with an enlarged head having a through hole extending transversely of a longitudinal axis of said spindle,

a support pin extending through said through hole and projecting at opposite ends from said hole,

a push member which is axially slidably mounted on said non-threaded end section,

said push member having an enlarged section and a reduced section which extends from said enlarged section toward said head,

a lever pivotally mounted at its one end on said support pin,

said one end of the lever having at least one circumferential cam surface so shaped that a distance from said pin gradually varies and arranged so as to act on an end wall of said reduced section, said lever being rotatable between a clamping position and a releasing position

an actuating member mounted on said support pin so as to be co-axially rotatable with said lever,

said actuating member including a pair of spaced side plates each having an inward edge separated by a nose point into a clamping edge section and a releasing edge section, a first actuator means disposed adjacent said clamping edge section so as to come into contact with said lever as the latter is turned to its clamping position, and a second actuator means disposed adjacent said releasing edge section so as to come into contact with said lever as the latter is turned to its releasing position,

a coil spring interposed between said push member and one end of said axle for urging the push member axially outwardly,

a spring washer mounted on said reduced section of the push member and interposed between said enlarged section of the push member and said inward edge of the actuating member,

said spring washer being elastically deformable into a substantially flattened shape when compressed,

said push member being prevented from sliding axially outwardly as long as said clamping edge section of the actuat-

ing member is in contact with said spring washer when the hub is mounted on a bicycle, and

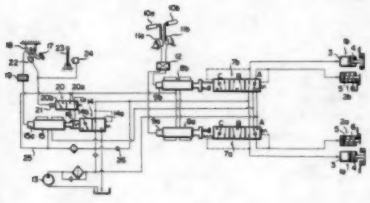
said spindle being axially slidable only when said releasing edge section of the actuating member is in contact with said spring washer when the hub is mounted on a bicycle.

4,400,039

ELECTRO-HYDRAULIC BRAKE SYSTEM HAVING ELECTRIC CONTROL MEANS

Yasuhiro Ogata, Hirakata, Japan, assignor to Kabushiki Kaisha Komatsu Seisakusho, Tokyo, Japan

Filed Mar. 17, 1981, Ser. No. 244,787
Claims priority, application Japan, Mar. 27, 1980, 55-38161
Int. Cl.³ B60T *13/22*
U.S. Cl. 303—3 **5 Claims**



1. A brake system for a vehicle, comprising:

a pair of brake means, each being spring-applied and hydraulically released;

a source of fluid under pressure;

a brake valve connected with said source of fluid and said brake means, said brake valve having formed therein a communication position where fluid under pressure is supplied to said brake means to release the same and an offset position where fluid in said brake means is drained to a tank to have said brake means spring-applied, said brake valve also having an actuating section thereof formed therein and being normally held in the communication position;

first electric actuator means connected with the actuating section of said brake valve for shifting the same to the offset position when actuated;

a brake pedal;

first sensor means for sensing the movement of said brake pedal and generating a first signal therefrom;

first controller means for actuating and controlling said first electric actuator means in accordance with the first signal received from said first sensor means;

a solenoid-operated auxiliary brake valve operatively connected with the actuating section of said brake valve and said source of fluid, said auxiliary brake valve having formed therein a drain position where the actuating section of said brake valve is connected to the tank and an offset operating position where fluid under pressure is introduced therethrough to the actuating section of said brake valve for shifting the same;

a brake lever for parking and emergency braki[illegible], and

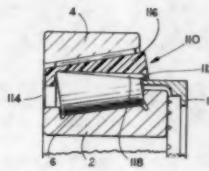
a first switch adapted to be switched on by the operation of said brake lever, said first switch being connected with said auxiliary brake valve for changing over the same to the offset position when it is switched on thereby shifting said brake valve to the offset position and applying said brake means.

4,400,040

TAPERED ROLLER BEARING WITH IMPROVED LUBRICATING MEANS

David G. Toth, Canton; Robert S. Trump, Bolivar, and Robert L. Leibensperger, Canton, all of Ohio, assignors to The Timken Company, Canton, Ohio

Filed Nov. 16, 1981, Ser. No. 321,386
Int. Cl.³ F16C *33/58, 33/46*
U.S. Cl. 308—187 **17 Claims**



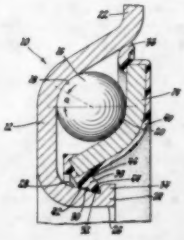
1. A tapered roller bearing comprising: a cone having a tapered raceway and a generally axially directed surface at the large end of the tapered raceway; a cup surrounding the cone and having a tapered raceway located opposite to the raceway of the cone; tapered rollers interposed between and contacting the tapered raceways of the cone and cup to enable the cone to rotate easily relative to the cup; and a lubricating ring mounted in a fixed position on and against the generally axially directed surface of the cone, the ring forming on the cone a trough that opens toward the axis of rotation for the bearing, the ring further enclosing axially directed channels that extend along the axially directed surface, each channel opening at its one end into the trough and at its other end toward the large ends of the tapered rollers, the region at which the trough opens toward the axis of rotation being located closer to the axis of rotation than the ends of the channels that open toward the large ends of the tapered rollers, whereby a fluent lubricant that is introduced into the trough will be conveyed by centrifugal force through the channels to be discharged against the tapered rollers when the cone rotates within the cup.

4,400,041

UNITIZED SEAL BEARING ASSEMBLY

Frederick E. Lederman, Sandusky, Ohio, assignor to General Motors Corporation, Detroit, Mich.

Filed Jan. 15, 1982, Ser. No. 339,189
Int. Cl.³ F16C *19/10, 33/76*
U.S. Cl. 308—219 **2 Claims**



1. An unitized, sealed thrust bearing assembly, comprising,

a first bearing race including a curvilinear raceway and a cylindrical flange extending axially inwardly of the bearing assembly at the inner edge thereof,

the cylindrical flange including an inner, radially inwardly facing wall and an outer, radially outwardly facing wall, the outer wall having a sealing surface sloped axially and radially inwardly with respect to the bearing assembly

axis and a radially outwardly extending retention rib at the axially inward terminus of the sealing surface,

a second bearing race coaxial with the first race and having a curvilinear raceway in confronting relation to the raceway of the first race with a complement of bearing balls therebetween, the second race having a first elastomeric sealing lip engageable with the first race and a second axially inwardly deflectable conical sealing lip having an outer wall sloped in the same direction as the sealing surface and at a greater angle with respect to the bearing assembly axis in the undeformed state, and terminating in an axially inwardly facing shoulder,

relative coaxial movement of the bearing races together during assembly deflecting the second sealing lip axially inwardly as the outer wall of the second sealing lip slides axially past the retention rib and into sealing engagement with the sealing surface and the retention shoulder moves adjacent the retention rib, axial movement tending to separate the bearing races engaging the retention shoulder with the retention rib to conically compress said sealing lip against the second race and prevent flexing of the lip past the retention rib to maintain the races as a unitary assembly.

4,400,042

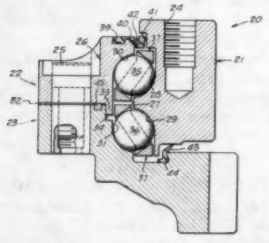
HIGH PERFORMANCE LOW TORQUE ANTI-FRICTION BEARING ASSEMBLY

Conrad M. Fritz, Altadena, Calif., assignor to Keystone Engineering Company, Los Angeles, Calif.

Continuation of Ser. No. 196,753, Oct. 14, 1980, abandoned. This application Jan. 7, 1982, Ser. No. 337,598

Int. Cl.³ F16C *19/10*

U.S. Cl. 308—227 **26 Claims**



1. A heavy-duty anti-friction bearing assembly suitable for use in supporting a stabilized platform or the like with minimal torque losses under simultaneously-occurring axial, radial and moment loads, comprising:

first, second and third annular forged alloy steel rings;

said first ring having an annular radial flange provided with a pair of arcuate raceways located one on either side of said radial flange;

said second and third rings including fastener means for clamping the same rigidly assembled axially of one another concentrically of said radial flange of said first ring, said second and third rings each having an arcuate raceway facing toward and spaced from a respective one of the arcuate raceways of said first ring;

a separate ring of pre-loaded balls located between the raceways of said first and second rings and the adjacent raceway of said pair of raceways on said first ring;

each of said raceways extending over an arc of substantially 90° and said balls and said raceways having a conformity constant of approximately 0.59; and

each of said rings of balls including a plurality of elongated cage ring segments arranged in end-to-end spaced apart relation and each provided with a plurality of openings each loosely accommodating a single one of said balls, said cage segments for each ring of balls lying in oppositely converging conical surfaces.

4,400,043

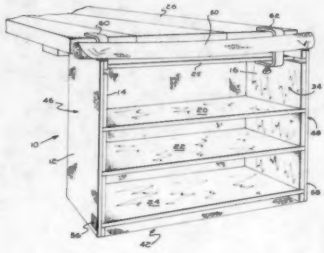
COLLAPSIBLE STORAGE CABINET

Robert W. Rossow, 89 Hazardville Rd., Longmeadow, Mass. 01106

Filed May 7, 1981, Ser. No. 261,370

Int. Cl.³ A47B *5/00*

U.S. Cl. 312—111 **3 Claims**



1. A collapsible storage cabinet comprising:

(a) a pair of sidewalls, each sidewall having a plurality of substantially transverse grooves for removably receiving a plurality of shelves;

(b) a plurality of shelves slidably receivable within said grooves;

(c) a flexible covering for the cabinet; and,

(d) attachment means for removably connecting the covering to the cabinet; said attachment means comprising an additional groove in each of the sidewalls and a plurality of strips which are connectable to the covering and insertable into said additional grooves.

4,400,044

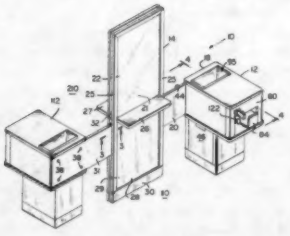
MODULAR CABINET SYSTEM

Hidetoshi Yoshiyuki, Bridgewater, N.J., assignor to Takara Company, Somerset, N.J.

Filed Mar. 23, 1981, Ser. No. 246,855

Int. Cl.³ A47B *67/00*; **A47G** *1/00*

U.S. Cl. 312—204 **7 Claims**



1. A modular cabinet system comprising:

(a) a first rectangular cabinet,

(b) a first standing mirror, said first standing mirror being spaced from said first rectangular cabinet and disposed in a parallel plane to the back side of said first rectangular cabinet,

(c) a first panel comprising connecting means disposed at its ends so as to connect one end to said first standing mirror and at the other end to said first rectangular cabinet,

whereby said first panel supports said first standing mirror,

(d) a first swivel drawer, said first swivel drawer extending from a first side of said first rectangular cabinet, to provide easy access to said first drawer at a location in front of said first standing mirror,

(e) a second standing mirror, said second standing mirror being spaced from and in the same plane as said first standing mirror,

(f) a second panel, said second panel being connected to said first and second standing mirrors,

(g) a second rectangular cabinet having a back side adjacent said second panel and extending outward in the same direction as said first rectangular cabinet,

(h) a second swivel drawer, said second swivel drawer extending outward from the front side of said second rectangular cabinet, to provide easy access to said second swivel drawer at a location in front of said second standing mirror,

(i) a third rectangular cabinet, said third rectangular cabinet being disposed on the opposite side of said second standing mirror from said second rectangular cabinet,

(j) a third panel, said third panel being in the plane of said second standing mirror and connecting said third rectangular cabinet to said second standing mirror, whereby the front side of said third standing mirror faces an opposite direction from the front sides of said first and second rectangular cabinets, and

(k) a third standing mirror affixed adjacent the back side of said second standing mirror.

4,400,045

BUILT-IN KITCHEN UNIT

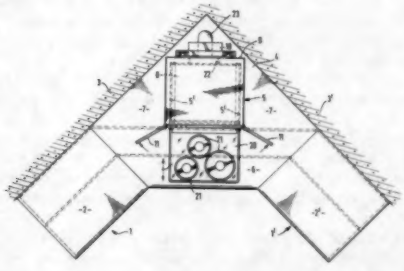
Horst Baschin, Bruchsal, Fed. Rep. of Germany, assignor to Neff-Werke Carl Neff GmbH, Bretten, Fed. Rep. of Germany

Filed Feb. 6, 1981, Ser. No. 232,419

Claims priority, application Fed. Rep. of Germany, Feb. 15, 1980, 8004602[U]; Feb. 15, 1980, 3005600

Int. Cl.[3] **A47B** *77/08;* **F24C** *15/18*

U.S. Cl. 312—236 **7 Claims**



1. In a built-in kitchen system including a baking and roasting oven and a surface cooking unit, which includes a plurality of cabinet modules disposed adjacent one another and provided with countertops defining a horizontal work surface, the improvement comprising: a wall cabinet housing integrated into said system and having an upper portion accommodating said oven and a lower portion accommodating said cooking unit; means mounting said cooking unit in said housing for horizontal displacement between a position within said housing and a position in front of said housing; and displacement means supporting said wall cabinet housing and arranged to move said housing vertically between raised and lowered positions, the raised position being located to place the bottom of said cooking unit level with said work surface.

4,400,046

REFRIGERATED SHOWCASE

Masashi Karashima, 88-5, Nakano, Ebina-shi, Kanagawa-ken, Japan

Filed Mar. 13, 1981, Ser. No. 243,454

Claims priority, application Japan, Feb. 6, 1981, 56-15827

Int. Cl.[3] **A47B** *77/08;* **A47F** *3/04*

U.S. Cl. 312—236 **7 Claims**

1. In a refrigerated showcase, having a front opening, in which a cold air flow for refrigerating goods within the showcase is provided along a front surface thereof across the front opening, the improvement comprising:

a plurality of spaced flexible continuous gas-impermeable curtains having mutually facing surfaces, respectively freely hanging from the showcase along a top edge thereof, each extending across the entire front opening of the showcase so as to prevent fluid communication between the interior of the showcase, including the cold air flow, and the environmental atmosphere exterior to the showcase; and

spacer means, fixed to and movable with one of the curtains at the facing surface thereof for separating the plurality of curtains from each other so as to maintain a continuous air space therebetween.

4,400,047

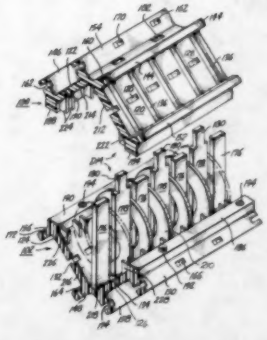
DISTRIBUTION MODULE FOR MULTI-WIRE GROUP

Alfred P. Simms, 1443 Maple St., Kent, Wash. 98031

Filed Jul. 14, 1981, Ser. No. 283,202

Int. Cl.[3] **H01R** *23/02*

U.S. Cl. 339—18 R **17 Claims**



1. A multi-wire distribution module for use in field splicing in a multi-wire telephone or like distribution system, said distribution module comprising:

an elongate insulative body,

a series of electrical conductor elements of generally disc-

like form arranged generally parallel to each other and coaxially of said body, and

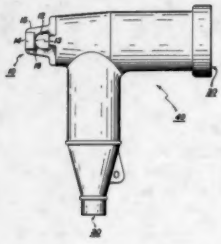
bridging prong receiving slots arranged in the side faces of said body and in sets radially around each conductor element and in several rows longitudinally of said body.

4,400,048

ELECTRICAL CONNECTOR WITH RESILIENT PULLING EYE

Norman M. Sacks, Westport, Conn., assignor to Burndy Corporation, Norwalk, Conn.

Filed Oct. 8, 1981, Ser. No. 309,857
Int. Cl.³ H01R *13/62*
U.S. Cl. 339—46 **14 Claims**



5. In an electrical connector of the type having a conductor means attached thereto and being disconnectably engageable with a mating electrical means, the connector enabling the transmission of electrical current between the connector means and the mating means when engaged with the mating means, the improvement comprising:

a pulling member on the connector for operably receiving a hook-type tool thereon adapted to connect and disconnect the connector to and from the mating means,

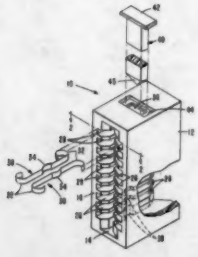
the pulling member having gripping means for resiliently engaging the tool whereby the tool is prevented from slipping and wobbling relative to the pulling member and is maintained in alignment with the pulling member.

4,400,049

CONNECTOR FOR INTERCONNECTING CIRCUIT BOARDS

David B. Schuck, Escondido, Calif., assignor to NCR Corporation, Dayton, Ohio

Filed Aug. 12, 1981, Ser. No. 292,309
Int. Cl.³ H01R *13/62*
U.S. Cl. 339—176 MP **7 Claims**



1. A connector for receiving confronting edges of two coplanar circuit boards and electrically interconnecting said circuit boards, said connector comprising:

a connector housing having oppositely directed faces, an elongated opening of each of said oppositely directed faces for receiving said circuit boards, and an elongated circuit board receiving cavity extending through said housing from one of said faces to the other of said faces;

a transverse passage extending through said housing and intersecting said cavity;

a plurality of electrical terminals within said cavity for electrically contacting conductors on said circuit boards;

means for supporting said terminals in spaced relation along opposing side walls within said cavity and opening to at least one of said faces at said elongated opening to permit insertion of said terminals; and

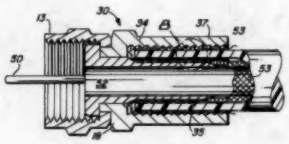
a terminal engaging pin for insertion through said transverse passage and between terminals on said opposing side walls, for engaging each of said terminals and holding said terminals in place within said connector housing.

4,400,050

FITTING FOR COAXIAL CABLE

Robert D. Hayward, Phoenix, Ariz., assignor to Gilbert Engineering Co., Inc., Phoenix, Ariz.

Filed May 18, 1981, Ser. No. 264,640
Int. Cl.³ H01R *17/04*
U.S. Cl. 339—177 R **9 Claims**



1. A fitting for mechanically and electrically connecting the end of a coaxial cable to a selected device, which includes

an outer conductor comprising a braid of electrically conductive strands,

a center conductor coaxial with said outer conductor,

a noncompliant dielectric disposed between said outer and said center conductor, and

a jacket of noncompliant material having an antifriction surface encasing said outer conductor,

and for positive and secure attachment to said cable and for electrical connection with said outer conductor, said fitting comprising:

(a) an electrically conductive body including a projecting elongate outer tubular element for receiving the end of said cable and a projecting elongate inner tubular element coaxial with said outer tubular element and receivable between said noncompliant dielectric and said outer conductor;

(b) internal gripping means carried by said outer tubular element for mechanically engaging said jacket, said braid being doubled back at the end of said cable to encircle said jacket and said gripping means including a plurality of spaced apart gripping elements sized and shaped to be received between said strands in response to inward deformation of said outer tubular element, strand receiving recesses being defined between said gripping elements, said inner tubular element acting as a support means for opposing said inward deformation; and

(c) connection means carried by said body for attachment to said selected device.

4,400,051

ELECTRICAL PLUG AND SOCKET CONNECTORS

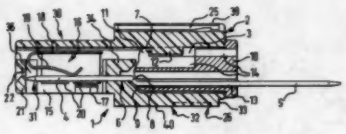
Paul P. Stenz, Detmold, Fed. Rep. of Germany, assignor to C. A. Weidmuller GmbH, Detmold, Fed. Rep. of Germany

Filed Apr. 17, 1981, Ser. No. 255,090

Claims priority, application Fed. Rep. of Germany, Apr. 17, 1980, 3014706

Int. Cl.³ H01R 4/24

U.S. Cl. 339—217 S 13 Claims



1. An electrical plug and socket connector comprising a plug member and a mating socket member, and in which: the plug member comprises an insulating plug housing, at least one plug contact pin therein, and contact-retaining means in the housing and in snap-action engagement therewith for holding the plug pin contact in the plug housing; the socket member comprises an insulating socket housing, at least one socket contact therein, and contact-retaining means in the socket housing and in snap-action engagement therewith for holding the socket contact in the socket housing; and the said socket contact comprises a contact pin identical to the said plug contact pin, and a cage member which embraces said socket contact pin, carries an internal resilient element adjoining said socket contact pin for exerting contact pressure on a said plug contact pin when inserted into said socket contact, and is disposed loosely with respect to the socket housing.

4,400,052

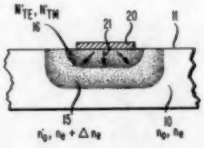
METHOD FOR MANUFACTURING BIREFRINGENT INTEGRATED OPTICS DEVICES

Rodney C. Alferness, and Janet L. Jackel, both of Holmdel, N.J., assignors to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed Mar. 19, 1981, Ser. No. 245,628

Int. Cl.³ G02B 5/174

U.S. Cl. 350—96.12 18 Claims



1. Method for manufacturing an integrated optics device comprising a substrate of optically anisotropic material, the substrate having a major surface, and a major direction in the surface, an ordinary index of refraction and an extraordinary index of refraction for electromagnetic radiation propagating in the major direction, the method comprising

(a) changing both the ordinary and the extraordinary index in a volume of the substrate, thereby producing a waveguide for both TE and TM modes of the radiation,

CHARACTERIZED BY the further step of

(b) adjusting the value of the difference between the ordinary index and the extraordinary index in at least part of the waveguide.

18. A device manufactured according to the method of claims 1 or 17.

4,400,053

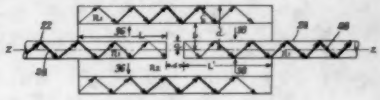
OPTICAL FIBER COUPLER

Ghaffar Kazkaz, 5 South Hatlen, Mount Prospect, Ill. 60056

Filed Jul. 10, 1980, Ser. No. 167,356

Int. Cl.³ G02B 7/26

U.S. Cl. 350—96.15 16 Claims



1. An optical fiber coupler comprising:

an elongated optical fiber having a central light guiding core of light-transmitting material, said core having a predetermined cross-section with an end portion characterized by an outer wall surface and an end wall surface;

an elongated tubular waveguide having a tubular light guiding core of light-transmitting material having a predetermined cross-section with inner and outer wall surfaces surrounding and enclosing said end portion of said central light guiding core;

said elongated optical fiber and said tubular waveguide being coaxial, said end portion of said central light guiding core having a predetermined coupling length extending into said tubular light guiding core and being spaced radially inwardly from said inner wall surface a uniform distance along the length thereof to provide a circumferential gap therebetween which has a uniform cross-section along the length thereof;

a light-transmitting spacer member filling said gap;

said central and tubular light guiding cores comprising material having a predetermined refractive index, said spacer member comprising material having a refractive index less than said predetermined refractive index; and

the cross-sectional dimensions of said central and tubular light guiding cores and said coupling length having predetermined values chosen according to Equations (3) and (4) enabling transverse optical power transfer through said circumferential gap between the central and tubular light guiding cores with minimal optical power transfer through said end unit surface of the central light guiding core.

4,400,054

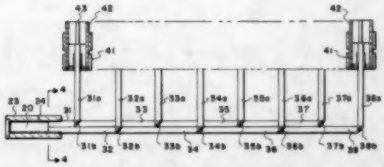
PASSIVE OPTICAL COUPLER

James R. Biard; John E. Shaunfield, both of Richardson, and Royce S. Speer, Wylie, all of Tex., assignors to Spectronics, Inc., Richardson, Tex.

Continuation of Ser. No. 949,861, Oct. 10, 1978, abandoned, which is a continuation of Ser. No. 707,428, Jul. 21, 1976, abandoned. This application Jan. 22, 1982, Ser. No. 341,873

Int. Cl.³ G02B 5/172

U.S. Cl. 350—96.15 27 Claims



1. An optical coupler including a scrambler rod comprising a body having rectangular dimensions in the plane normal to the longitudinal axis thereof and a plurality of substantially inflexible, solid, unitary, elongated side arms of rectangular dimensions in the plane normal to the longitudinal axes thereof positioned and rigidly affixed adjacent each other with the

input end faces of all said side arms in a common plane parallel with the output face of said scrambler rod and optically coupled to the output face of said scrambler rod and the longitudinal axis of each of said side arms in a single plane parallel with the longitudinal axes of the other side arms and parallel with the longitudinal axis of said scrambler rod, the total surface area of said end faces in said common plane being substantially equivalent to the surface area of said output face.

4,400,055

OPTICAL POWER DISTRIBUTOR AND METHOD FOR MANUFACTURING THE SAME

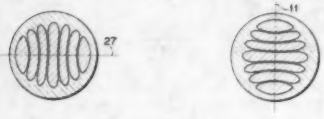
Takeshi Ozeki, Tokyo, and Shigeru Ohshima, Funabashi, both of Japan, assignors to Tokyo Shibaura Denki Kabushiki Kaisha, Kawasaki, Japan

Continuation of Ser. No. 129,749, Mar. 12, 1980, abandoned. This application Mar. 29, 1982, Ser. No. 363,400

Claims priority, application Japan, May 8, 1979, 54-55867

Int. Cl.³ G02B *5/172*

U.S. Cl. 350—96.15 **7 Claims**



1. An optical power distributor comprising first and second sections each of which consists of optical fibers thermally fused at one end portion wherein said first section comprises at least two fibers and said second section comprises at least three fibers, said end portion consisting of a united cladding having a circular sectional profile, including cores having deformed relatively elongated sectional profiles and packed in the cladding, the centers of all of said sectional profiles of said cores in each of said first and second sections being colinear, and an intermediate cladding separating all of said cores, the end faces of said end portions butted on each other and spliced by means of thermal fusing in such a manner that at least one core of said first section overlaps at least two cores of said second section at a splice plane, whereby optical power is distributed through said splice plane.

4,400,056

EVANESCENT-WAVE FIBER REFLECTOR

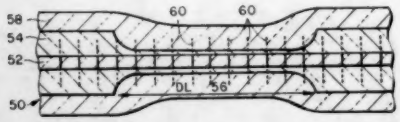
Paolo G. Cielo, Montreal, Canada, assignor to Her Majesty the Queen as represented by the Minister of National Defence of her Majesty's Canadian Government, Montreal, Canada

Filed Mar. 17, 1981, Ser. No. 244,682

Claims priority, application Canada, Jul. 9, 1980, 356606

Int. Cl.³ G02B *5/14*

U.S. Cl. 350—96.19 **5 Claims**



1. A method for making an optical fiber reflector from a length of optical fiber having a longitudinal axis, a core of a first light transmitting material and a cladding over said core of a second light transmitting material; said method comprising;

(a) etching away a predetermined thickness of the cladding over a portion of the optical fiber;

(b) applying a layer of photoresist material to the etched portion of the fiber;

(c) coupling counter-propagating light beams into said optical fiber at opposite ends thereof so that the counter-propagating light beams interfere to generate a standing wave pattern to which the photoresist material is exposed:

(d) developing the exposed photoresist material to fix said wave pattern therein; and

(e) using the fixed wave pattern to form an optical discontinuity of a selected form in said optical fiber, said discontinuity functioning as the distributed-feedback reflector.

4,400,057

INFORMATION CARRIERS, METHOD OF FORMING AND COPYING SAID CARRIERS

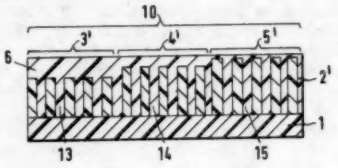
Roland Moraw, and Renate Schädlich, both of Naurod, Fed. Rep. of Germany, assignors to Hoechst Aktiengesellschaft, Frankfurt am Main, Fed. Rep. of Germany

Continuation of Ser. No. 861,491, Dec. 16, 1977, Pat. No. 4,294,913. This application Jul. 21, 1980, Ser. No. 170,685

Claims priority, application Fed. Rep. of Germany, Dec. 17, 1976, 2657246

Int. Cl.³ G02B *5/18*

U.S. Cl. 350—162.20 **17 Claims**



1. An information carrier comprising:

a recording layer applied to a carrier material, said recording layer containing a relief image for reproducing, in zero order diffraction multicolor projection using additive color formation, information stored in said relief image,

said relief image comprising relief part-images,

each relief part-image being produced by the image-wise exposure of said recording layer through an individual color separation original and having a grating depth corresponding to one of the particular projection colors,

said relief part-images arranged in a single layer for all colors and bordering on one another without superposition and with non-overlapping areas of their particular projection color,

said recording layer further having superimposed thereon a relief grating which has only a single grating depth within each relief part-image,

whereby the grating depths of the relief part-images are different from each other.

4,400,058

TUNABLE FABRY-PEROT FILTER

William W. Durand, Edina, and Ronald E. Peterson, Shoreview, both of Minn., assignors to Honeywell Inc., Minneapolis, Minn.

Continuation-in-part of Ser. No. 159,984, Jun. 16, 1980, abandoned. This application Jun. 4, 1982, Ser. No. 384,842

Int. Cl.³ G02B *5/28*

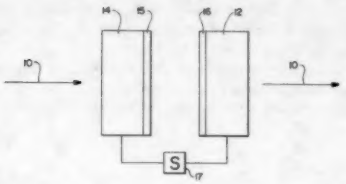
U.S. Cl. 350—166 **6 Claims**

1. A tunable Fabry-Perot filter device, comprising:

a pair of low index substrates having a refractive index of less than 2.4 and mounted in parallel relationship so as to present facing sides to each other in an optical path;

a high index, non-metallic coating having a refractive index of at least 4.0 and an optical thickness less than one half of the minimum wavelength to be transmitted, said high

index coating being on said facing sides of each said low index substrates; and



spacer means for mounting said low index substrates and for adjusting the distance between said facing sides.

4,400,059

LIQUID CRYSTAL DISPLAY DEVICE

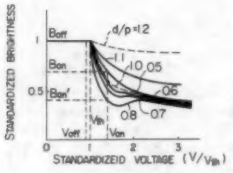
Yoshiharu Nagae, Hitachi; Tetsuo Ito, Mito; Masaaki Kitajima, Hitachi; Hideaki Kawakami, Mito; Fumio Nakano, Hitachi; Hidetoshi Abe, Katsuta; Masato Isogai, Hitachi; Michio Ooue, Hitachi, and Akio Mukoh, Hitachi, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed May 6, 1981, Ser. No. 261,033

Claims priority, application Japan, May 9, 1980, 55-60575

Int. Cl.³ G02F *1/133;* C09K *3/34;* G02F *1/13*

U.S. Cl. 350—332 **6 Claims**



1. A liquid crystal display device comprising a pair of base plates facing each other at a predetermined distance, a plurality of electrodes formed on the facing surfaces of the base plates, a liquid crystal layer placed between the base plates and means for orienting perpendicularly liquid crystal molecules provided to at least the electrode portions contacting with the liquid crystal layer, and means for driving said device by time division driving using the voltage averaging method, the liquid crystal layer comprising one or more nematic liquid crystals having a negative dielectric anisotropy, one or more dichroic dyes and one or more optically active substances, and a ratio of the thickness of the liquid crystal layer (d) to the pitch (P) in cholesteric state, d/P, being in the range of 0.6 to 1.0, whereby a liquid crystal display device having a displayed image of high contrast can be achieved.

4,400,060

CELL ISOLATION IN BISTABLE NEMATIC LIQUID CRYSTAL CELLS

Julian Cheng, Little Silver, N.J., assignor to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed Apr. 8, 1981, Ser. No. 252,148

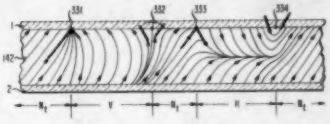
Int. Cl.³ G02F *1/13*

U.S. Cl. 350—339 R **6 Claims**

1. A liquid crystal cell comprising a liquid crystal material having orientational directors disposed between a first substrate surface of a first substrate and a second substrate surface of a second substrate, said liquid crystal material being mainly in the nematic mesophase, and said substrate surfaces being treated so that said orientational directors are aligned in predetermined patterns at said substrate surfaces, which patterns provided substantially bistable volumes in said liquid crystal material;

characterized in that:

at least two of said substantially bistable volumes are separated by a neutral isolation region, said first substrate surface is treated so that, along a portion of the boundary between one of said at least two substantially bistable volumes and said neutral isolation region, the space angle



between the orientational director alignments on one side of the boundary and the orientational director alignments on the other side of the boundary has a value substantially in the range of 45 degrees to 135 degrees; and

said second substrate surface is treated so that, along a portion of the boundary between said one of said at least two substantially bistable volumes and said neutral isolation region, there is substantially no discontinuity in orientational director alignment.

4,400,061

LIQUID CRYSTAL ESTER COMPOUNDS EXHIBITING A LOW OR NEGATIVE DIELECTRIC ANISOTROPY AND LIQUID CRYSTAL MATERIALS AND DEVICES INCORPORATING SUCH COMPOUNDS

Neil Carr, Hull; George W. Gray, Cottingham, and Stephen M. Kelly, Hull, all of England, assignors to Her Majesty's Government of the UK., London, England

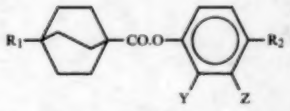
Filed Jan. 30, 1981, Ser. No. 229,876

Claims priority, application United Kingdom, Jan. 30, 1980, 8003131; Jun. 27, 1980, 8021069

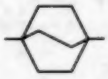
Int. Cl.³ G02F *1/13;* C09K *3/34;* C07C *69/74, 69/76, 121/64*

U.S. Cl. 350—350 **9 Claims**

1. A liquid crystal ester compound exhibiting a negative dielectric anisotropy having the structural formula:



where R_1 is an alkyl group; R_2 is an alkyl or alkoxy group;



is a 1,4-disubstituted bicyclo(2.2.2) octane ring;

is a 1,4-disubstituted benzene ring;

Y is a group selected from the class consisting of halogen and cyano; and

Z is a group selected from the class consisting of hydrogen, halogen and cyano;

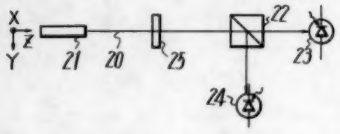
provided that where Z is other than hydrogen it is the same as Y.

4,400,062

WAVE PLATE RETARDER

Hiroshi Mori, Matsudo, and Mikio Sugiki, Tokyo, both of Japan, assignors to Sony Corporation, Tokyo, Japan

Filed Sep. 11, 1979, Ser. No. 74,308
Int. Cl.³ G02B 1/24
U.S. Cl. 350—406 **2 Claims**



1. A method of making a wave plate retarder comprising the steps of:

placing a film of birefringent material having an optical axis with its surface normal to a linearly polarized beam of light;

rotating said film about an axis parallel to said beam of light;

measuring maximum and minimum values of a linearly polarized component of said beam of light after passing through said film during said rotating of the latter;

determining a retardation phase angle from the following relationship:

$$R=\tfrac{1}{2}(1+\cos\Gamma)$$

in which R is the ratio of said minimum value to said maximum value, and Γ is the retardation phase angle for said film;

forming from said film two sheets having respective optical angles; and

overlapping said two sheets with an angle C between their optical axes which is determined from the following relationship:

$$R^1=(\tfrac{1}{2}\cos 2\Gamma-2\cos\Gamma+3/2)\cos^4 C+2(\cos\Gamma-1)\cos^2 C+1$$

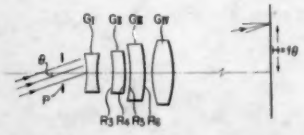
in which R^1 is $\frac{1}{2}$ for a $\frac{1}{4}$ wave plate retarder or R^1 is 1 for a $\frac{1}{2}$ wave plate retarder.

4,400,063

F(θ) LENS SYSTEM OF FOUR-GROUP CONSTRUCTION

Bun Hayashida, Yokosuka, Japan, assignor to Nippon Kogaku K.K., Tokyo, Japan

Filed Jun. 8, 1981, Ser. No. 271,284
Claims priority, application Japan, Jun. 20, 1980, 55/82791
Int. Cl.³ G02B 3/00, 27/17
U.S. Cl. 350—415 **4 Claims**



1. An fθ lens system having an entrance pupil at a remote position on the incident light side of the lens system and having negative distortion such that the image height H of a parallel light beam incident at an angle θ with respect to the optical axis with said entrance pupil as the center is $H=f\theta$, where f is the focal length of the entire system, said lens system including, in succession from the entrance pupil side:

a first group having at least one negative lens and having a composite negative refractive power;

a second and a third group each having a meniscus lens component having its concave surface facing said entrance pupil side; and

a fourth group having at least one positive lens and having a composite positive refractive power;

and wherein the lens system satisfies the following conditions:

$$0.08f<R_{III}<0.35f$$

$$|R_{III}|<|R_{II}|$$

$$f<f_{II}$$

$$f<f_{III}$$

$$0.8<R_4/R_3<1.2$$

$$0.7<R_6/R_5<1.5$$

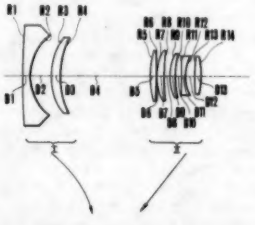
where R_3 and R_4 represent the radii of curvature of the opposite lens surfaces of said second group from said entrance pupil side, R_5 and R_6 represent the radii of curvature of the opposite lens surfaces of said third group from said entrance pupil side, $R_{II}=(R_3+R_4)/2$, $R_{III}=(R_5+R_6)/2$, and f_{II} and f_{III} represent the focal lengths of said second group and said third group, respectively.

4,400,064

ZOOM LENS

Keiji Ikemori, Yokohama, and Akira Tajima, Kawasaki, both of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Jul. 8, 1981, Ser. No. 281,554
Claims priority, application Japan, Jul. 11, 1980, 55-94776
Int. Cl.³ G02B 3/04, 15/14
U.S. Cl. 350—426 **6 Claims**



1. A zoom lens having a size smaller than prior art zoom lenses satisfying the following conditions:

said zoom lens consisting of first and second lens groups disposed in respective order from its object side to its image side, said first lens group having a negative refractive power, said second lens group having a positive refractive power, the air separation between said first and second lens groups being varied to effect zooming,

said first lens group consisting of a first lens having a negative refractive power and a second lens having a positive refractive power disposed in respective order from its object side to its image side,

said first lens being made of a plastic material and having lens surfaces of which the lens surface at the image side has stronger refractive power than the lens surface at the object side, at least one of said lens surfaces being an aspherical surface being shaped such that as the height of

incidence from the optical axis increases, the positive refractive power is increased,

said second lens of positive refractive power being in the form of a meniscus lens having its convex surface directed toward its object side.

4,400,065

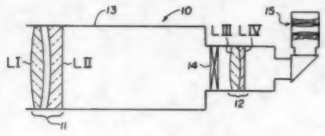
MULTI-PURPOSE TELESCOPE

Albert Nagler, 15 Green Hill La., Spring Valley, N.Y. 10977

Filed May 18, 1981, Ser. No. 264,225

Int. Cl.³ G02B *11/12, 23/00*

U.S. Cl. 350—476 **3 Claims**



1. A multi-purpose telescope comprising a Petzval type objective having a front achromat and a rear achromat widely spaced from each other, and an iris disphragm located between said achromats and proximate to said rear achromat, and wherein said Petzval type objective includes lens elements LI and LIII made of BK-7 glass having a refractive index of 1.5168 and an Abbe number of 64.2 and lens elements LII and LIV made of SF-12 glass having a refractive index of 1.6477 and an Abbe number of 33.8 and said lens elements have the parameters specified in the following table wherein all dimensions are given in millimeters:

Lens Element	Radii	Lens Thickness "d"	Lens Separation "s"	Clear Aperture	Outside Diameter
LI	r1 = +411.43				
		d1 = 16.0		126	132
	r2 = −544.15				
			s1 = 6.0		
LII	r3 = −501.7				
		d2 = 12.0		126	132
	r4 = −6890.0				
			s2 = 480.0		
LIII	r5 = +253.263				
		d3 = 8.0		60	64
	r6 = −253.263				
			s3 = 0.0		
LIV	r6 = −253.263				
		d4 = 8.0		60	64
	r7 = −1386.0				

4,400,066

MOUNTING AND PRECISION DRIVE SYSTEM FOR ASTRONOMICAL TELESCOPE, AND THE LIKE

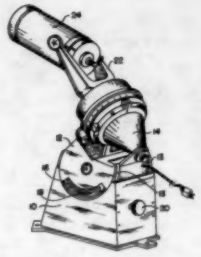
Edward R. Byers, 29001 W. Hwy. 58, Barstow, Calif. 92311

Filed Jun. 4, 1981, Ser. No. 270,590

Int. Cl.³ G02B *23/16*

U.S. Cl. 350—568 **5 Claims**

1. A mount for supporting a telescope for angular movement about a polar axis and a declination axis, said mount comprising: a base; a first member mounted on said base for rotation about a horizontal axis; a second member mounted on said first member for rotation about a polar axis; a drive motor mounted on said first member; a worm coupled to the drive motor to be driven thereby; a worm gear sector mounted on said second member in position to be engaged by said worm to enable the drive motor to turn said second member through a predetermined arc about said polar axis; a resilient member for holding said worm in engagement with said worm gear sector; and manually operable means for moving said worm against the



force of said spring away from said worm gear sector to disengage said worm from said worm gear sector.

4,400,067

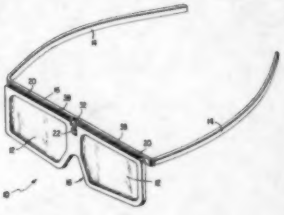
ONE-PIECE SPECTACLE WITH HINGE

Edward J. Joffe, 940 Park Ave., Linden, N.J. 07036

Filed Dec. 8, 1981, Ser. No. 328,603

Int. Cl.³ G02C *9/02*

U.S. Cl. 351—59 **4 Claims**



1. A one-piece spectacle frame adapted to be fitted with insertable lenses comprising:

a pair of temple pieces;

a crossbar connecting the forward ends of said temple pieces;

a lens rim and bridge piece;

a web hinge connecting said crossbar and said lens rim and bridge piece; and

inter-engageable latch means on said crossbar and said lens rim and bridge piece; whereby said lens rim and bridge piece and said pair of temple pieces may be oriented in a first, substantially planar, configuration and, upon hinging of said web hinge, may be oriented in a second, in-use configuration; and wherein said latch means serves to retain said frame in said second configuration.

4,400,068

MICROFICHE READER CARRIER ASSEMBLY

Stephen P. Hirsch, North Prairie, Wis., assignor to Realist, Inc., Menomonee Falls, Wis.

Filed Apr. 19, 1982, Ser. No. 369,830

Int. Cl.³ G03B *23/08*

U.S. Cl. 353—27 R **9 Claims**

1. A microfiche assembly comprising,

a base provided with spaced parallel rails extending fore and aft on the base,

a subcarrier slidably mounted on the rails,

a fiche carrier,

spaced parallel front and rear bearing means between the

carrier and subcarrier enabling the carrier to move sideways relative to the subcarrier,

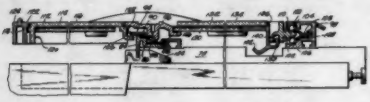
means preventing vertical separation of said rear bearing means,

said front bearing means allowing vertical separation,

means for latching the carrier to the subcarrier by preventing vertical separation of the front bearing means to retain the front bearing means effective and prevent removal of the carrier from the subcarrier,

said latching means being operable to release the carrier to permit vertical separation of the front bearing means,

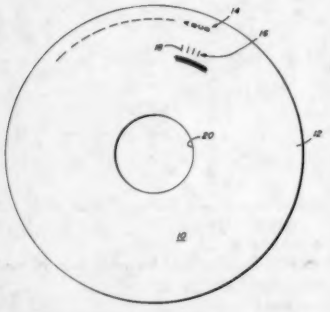
said rear bearing means permitting horizontal separation when the front of the carrier is raised.



4,400,069
PHOTOTYPESETTER FONT DISK

Alfred J. St. Pierre, West Boxford, Mass.; Dann Darnstaedt, Kingston, N.H., and Laurence S. Blake, West Peabody, Mass., assignors to Compugraphic Corporation, Wilmington, Mass.

Filed May 15, 1981, Ser. No. 264,620
Int. Cl.³ B41B *17/32, 17/42*
U.S. Cl. 354—11 **17 Claims**



17. A phototypesetting apparatus comprising:

a disk substrate;

a plurality of light modifying indicia positioned on said disk substrate in an annular array with each indicia being circumferentially spaced from an adjacent indicia;

a plurality of circumferentially spaced timing marks positioned on said disk substrate in an annular array that defines a strobe timing track, said timing marks each being located at a predetermined position with respect to an associated indicia;

a plurality of circumferentially spaced data marks located within said strobe timing track with the data marks being positioned between the timing marks, said data marks representing font disk information in digital form;

means responsive to said spaced timing marks and spaced data marks in said strobe timing track for producing signals representative of the presence and absence of said timing and data marks at a selected location with respect to said annular array that defines the strobe timing track;

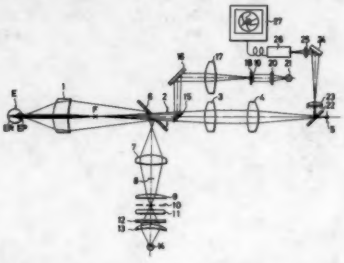
means responsive to said signals for separating the signals into timing marks signals and font disk information signals; and,

utilization means responsive to said font disk information signals.

4,400,070
FOCUS DETECTING DEVICE FOR OPTHALMOLOGIC INSTRUMENTS

Masaru Isono; Kazuo Nunokawa; Masayuki Kondo, and Shinzo Takada, all of Tokyo, Japan, assignors to Tokyo Kogaku Kikai Kabushiki Kaisha, Tokyo, Japan

Filed Jan. 28, 1982, Ser. No. 343,512
Claims priority, application Japan, Jan. 29, 1981, 56/11894
Int. Cl.³ G03B *3/10, 29/00;* **A61B** *3/10;* **H04N** *5/26*
U.S. Cl. 354—25 **7 Claims**

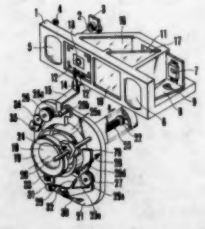


1. A focus detecting device for ophthalmologic instruments comprising target means including a target pattern comprised of a first slit having a longitudinal axis and a second and third slits disposed in parallel with and at the opposite sides of said first slit, said second and third slits being symmetrical with respect to the first slit, first deflecting means for deflecting a luminous flux through the first slit in one direction perpendicular to the longitudinal axis of the first slit and second deflecting means for deflecting luminous flux through each of the second and third slits in the opposite direction; a target projection system for projecting said target pattern on a patient's eye fundus to produce a target image comprising slit images of the first, second and third slits; an imaging system for forming an image of luminous flux from the target image on the eye fundus; means for photoelectrically detecting distances between the first slit image and the second slit image and between the first slit image and the third slit image to thereby detect a position wherein the target image is focused on the eye fundus.

4,400,071
AUTO-FOCUS CAMERA

Shuichi Tamura, Yokohama; Toyotosi Suzuki; Hideo Tamamura, both of Tokyo, and Mutsuhide Matsuda, Yokohama, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 193,459, Oct. 3, 1980, abandoned. This application May 3, 1982, Ser. No. 374,530
Claims priority, application Japan, Oct. 8, 1979, 54-129653
Int. Cl.³ G03B *13/08, 13/20*
U.S. Cl. 354—25 **6 Claims**



1. An auto-focus camera comprising:

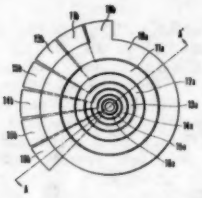
a photo-taking lens;
focusing means arranged to move said photo-taking lens for focusing;
a first distance measuring optical path including a light emitting element, said optical path being arranged to scan an object to be photographed with a light beam in response to the operation of said focusing means;
a second distance measuring optical path including a light receiving element, said second distance measuring optical path being arranged to receive a reflection light of said light beam from said object;
a viewfinder optical system;
a photo-taking visual field mask disposed within said viewfinder optical system, said mask having a mark indicating a photographing range in its circumferential portion, and an opening at its central portion, and being fixed to the finder framework with positional adjustment with respect to the photographic optical axis; and
a distance measuring visual field mask separated from said photo-taking visual mask and disposed within the viewfinder optical system, said mask having a mark indicating a distance measuring visual field, and being adjustable in position independently from said photo-taking visual mask.

4,400,072

DIAPHRAGM DEVICE FOR A CAMERA WITH INTERCHANGEABLE LENSES

Ryoichi Suzuki, Kawasaki, and Takashi Uchiyama, Yokohama, both of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Jul. 30, 1980, Ser. No. 173,825
Claims priority, application Japan, Jul. 31, 1979, 54-97786
Int. Cl.³ G03B *7/08, 9/56*
U.S. Cl. 354—43 **8 Claims**



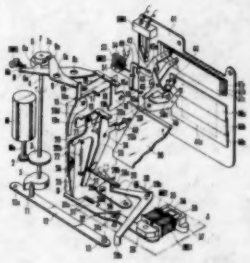
1. A camera system comprising:
(A) a camera body including:
(a) a light measuring circuit for producing an output corresponding to the brightness of an object;
(b) a shutter release operation member;
(c) power supply means for supplying power to the light measuring circuit in response to a first step in a stroke of the release operation member;
(d) an external terminal for transmitting a voltage from the camera body;
(e) switching means for sending the voltage to the external terminal in response to a second step in the stroke of the release operation member; and
(B) a lens barrel couplable to the camera body and including:
(a) an external terminal to be connected to the external terminal of the camera when the lens barrel is coupled with the camera body;
(b) an analogue-digital converting circuit for converting the voltage input through the external terminal into a digital signal; and
(c) a diaphragm device having a solid state member and a plurality of electrode members, said solid state member being arranged for changing light shading characteristics when an electric signal is applied to the electrode members,
said diaphragm device further comprising a selecting circuit for selecting the electrode members on the basis of a digital signal from the analogue-digital converting circuit and applying the electrical signal to the selected electrode members, so that the solid state member changes the light shading characteristics of a portion corresponding to the digital signal to restrict the diaphragm aperture in correspondence to the digital signal.

4,400,073

SAFETY DEVICE FOR A CAMERA WITH A WINDING MOTOR

Yoichi Tosaka, Shakujii; Masanori Uchidoi, Yokohama; Yoshihiro Shigeta, Tokyo; Ryoichi Yoshikawa, and Shosuke Haraguchi, both of Yokohama, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Aug. 24, 1981, Ser. No. 295,324
Claims priority, application Japan, Aug. 28, 1980, 55-118620
Int. Cl.³ G03B *9/66, 17/42*
U.S. Cl. 354—173 **8 Claims**



1. A camera comprising:
(a) shutter means, including at least one shutter blade, movable between a first position to initiate an exposure and a second position to terminate the exposure;
(b) signal producing means for producing a signal for moving said shutter blade to the second position;
(c) detecting means for producing a signal in response to completion of travel by said shutter blade to the second position;
(d) first advance means responsive to the signal from said detecting means for advancing said shutter blade to a first position;
(e) timer means for beginning a delay operation in response to the signal from said signal producing means and for producing a signal after the lapse of a length of time required for completion of travel by said shutter blade to the second position; and
(f) second advance means responsive to the signal from the timer means for forcibly advancing said shutter blade to the first position in the absence of the signal from said detecting means.

4,400,074

AUTOMATIC REWINDING CAMERA

Kazuhiko Akiyama; Takeshi Yoshino; Michihiro Shiina; Shigeo Sato; Tetsuo Nishizawa; Toshio Yoshida, and Nobuo Kobayashi, all of Omiya, Japan, assignors to Fuji Photo Optical Co., Ltd., Saitama, Japan

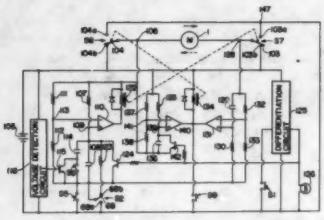
Filed Mar. 1, 1982, Ser. No. 353,031
Claims priority, application Japan, Feb. 27, 1981, 56-26731; Mar. 2, 1981, 56-28365; Mar. 2, 1981, 56-28369; Mar. 9, 1981, 56-32476; Mar. 16, 1981, 56-35397[U]; Mar. 16, 1981, 56-35400[U]; Mar. 16, 1981, 56-36473; Mar. 16, 1981, 56-36474
Int. Cl.³ G03B *1/18, 17/36, 17/42*
U.S. Cl. 354—173 **25 Claims**

1. In a camera having a shutter and reversible motor for

advancing and rewinding a photographic film and control means for controlling the motor to rotate in forward and reverse directions, and means automatically to actuate the motor to advance the photographic film one frame after each actuation of the shutter and to rewind the film after all the film has been exposed; the improvement comprising:

rotatable means which is driven by movement of said photographic film;

signal producing means responsive to rotation of said rotatable means for producing first signals;



timer means for measuring a predetermined active time shorter than the time required to advance said photographic film one frame, said timer means measuring also a predetermined active time longer than the time required to advance said photographic film one frame and permitting the motor to rotate in the forward direction when the camera is not loaded with film, for purposes of demonstrating the camera;

reset means for resetting said timer means when said reset means receives a said first signal; and

means to reverse the motor to rewind the film when said timer means completes the measurement of said predetermined active time.

4,400,075

AUTOMATIC FOCUS CAMERA WITH INTERCHANGEABLE LENS

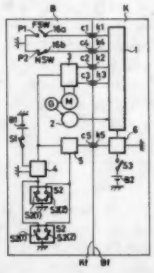
Yasumasa Tomori, Sakado, and Mituhiko Shimoda, Asaka, both of Japan, assignors to Asahi Kogaku Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Aug. 31, 1981, Ser. No. 298,170

Claims priority, application Japan, Sep. 10, 1980, 55-125543; Jan. 21, 1981, 56-7218[U]

Int. Cl.³ G03B *3/10, 13/02*

U.S. Cl. 354—195 **19 Claims**



1. An automatic focus camera with an interchangeable lens, comprising an interchangeable lens barrel having focussing lens means movable in directions of the optical axis of the camera, and a camera body having a focus detecting device which detects an image of an object formed by the focussing lens means, said lens barrel having a driving motor for axially moving the focussing lens means in accordance with a detection signal of the focus detecting device, wherein the improvement comprises a switch circuit means on the camera body for actuating the focus detecting device and the driving motor, and an external actuation switch on the lens barrel for actuating the focus detecting device and the driving motor, independently of the actuation of the switch circuit means on the camera body.

4,400,076

FINGER ABUTMENT DEVICE FOR CAMERA

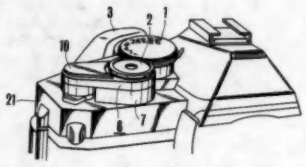
Yuzo Miura, Seki; Makoto Katsuma, Kawasaki, and Masayuki Suzuki, Tokyo, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Feb. 12, 1982, Ser. No. 348,340

Claims priority, application Japan, Feb. 20, 1981, 56-23511[U]

Int. Cl.³ G03B *17/00*

U.S. Cl. 354—202 **5 Claims**



1. A finger abutment device for a camera having a shutter-release button and a rapid-winding lever positioned adjacent to each other, comprising a finger abutment member extending from the mount position of said shutter-release button to cover the axis portion of the rapid-winding lever.

4,400,077

PHOTOSENSITIVE DRUM FOR ELECTROSTATIC COPYING APPARATUS

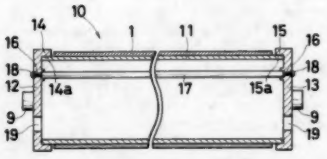
Nobuhiko Kozuka, Suita; Ryutaro Yamagata, Nishinomiya; Shigeo Koyama, Toyonaka; Hiromi Sakata, Neyagawa, and Atsushi Kano, Amagasaki, all of Japan, assignors to Mita Industrial Company Limited, Osaka, Japan

Filed Oct. 22, 1981, Ser. No. 313,975

Claims priority, application Japan, Nov. 12, 1980, 55-159874

Int. Cl.³ G03G *15/00*

U.S. Cl. 355—3 DR **5 Claims**



1. A photosensitive drum assembly capable of being, as a unit, mounted on and detached from an electrostatic copying apparatus, said assembly comprising:

a cylindrical drum having provided around the outer peripheral surface thereof a photosensitive member, said drum having a center axis and axially opposite ends;

a pair of flange members fitted over respective said ends of said drum, each said flange member including a disc-shaped portion adjacent a respective end surface of said drum and an integral cylindrical flange portion extending axially from said disc-shaped portion toward the other said flange memeber, said flange portion having an inner cylindrical surface in contact with a respective end portion of said outer peripheral surface of said drum, and said

flange portion having an outer peripheral surface having a diameter greater than the diameter of the outer surface of said photosensitive member;

at least one connecting rod extending through the interior of said drum in a direction parallel to said axis between said disc-shaped portions of said flange members; and

threadable means, associated with opposite ends of said connecting rod, for threadably connecting said disc-shaped members to said connecting rod, and thereby for urging said flange members toward each other, whereby said drum and flange members form a unit which is mountable on and detachable from an electrostatic copying apparatus.

4,400,078

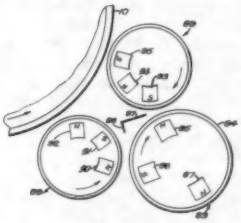
ELECTROPHOTOGRAPHIC COPYING APPARATUS AND SUBSYSTEMS THEREFOR

Edward F. Mayer, San Jose, Calif., assignor to Ricoh Company, Ltd., Tokyo, Japan

Division of Ser. No. 199,096, Oct. 20, 1980. This application Apr. 2, 1982, Ser. No. 364,654

Int. Cl.³ G03G *15/00, 15/08*

U.S. Cl. 355—3 DD **9 Claims**



1. An electrophotographic copying apparatus including a photosensitive surface movable cyclically passed a plurality of processing stations and adapted to retain for two cycles thereof an electrostatic latent image formed on said photosensitive surface by exposing charged portions of said surface to a light image of an original, one of said stations including a developing station having means for forming two magnetic brushes of developing powder adapted to rotate in opposite directions to each other for wiping said latent image in one direction and then the other with said developing powder, including means for removing excess developing powder from said photosensitive surface including an elongate magnetic element having its poles formed on opposited longitudinal sides, said element being movable between a position placing one end of said element adjacent said surface for attracting excess developing powder and a more horizontal position placing the other end thereof into contact with a magnetic shunt to reduce the magnetic field strength at said one end to release the developing powder held thereby into a collecting area.

4,400,079

INJECTION ROLLER DEVELOPER FOR ELECTROPHOTOGRAPHIC COPIER AND BIASING SYSTEM THEREFOR

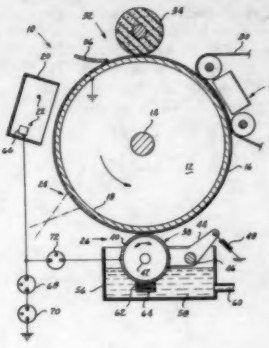
Benzion Landa, Alberta, Canada, assignor to Savin Corporation, Valhalla, N.Y.

Filed Sep. 24, 1980, Ser. No. 190,369

Int. Cl.³ G03G *15/10*

U.S. Cl. 355—10 **12 Claims**

1. In an electrophotographic copier, a photoconductor adapted to bear an electrostatic image on its surface, a roller, means for resiliently urging said roller toward said surface, means for supplying liquid developer to said roller, means for moving said photoconductor past said roller, and means for rotating said roller at such a velocity that the hydrodynamic pressure of said liquid developer on said roller forces said roller away from said photoconductor against the action of



said urging means to form a gap for the injection of said developer.

4,400,080

TWO-DRUM TYPE COPYING MACHINE HAVING IMPROVED ILLUMINATION EFFICIENCY

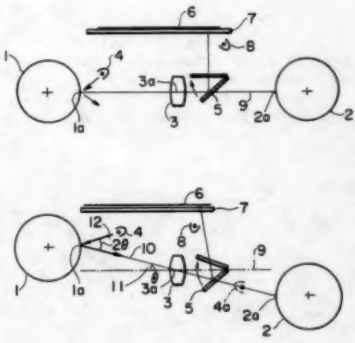
Ryota Ogawa; Michiro Oishi, and Yasunori Arai, all of Tokyo, Japan, assignors to Asahi Kogaku Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Sep. 22, 1981, Ser. No. 304,469

Claims priority, application Japan, Sep. 24, 1980, 55-131665; Jun. 15, 1981, 55-92009

Int. Cl.³ G03G *15/00*

U.S. Cl. 355—11 **8 Claims**



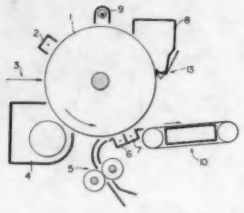
1. In a copying machine of the type having a rotatable memory drum having an axis of rotation passing through the center thereof, a rotatable transfer drum having an axis of rotation passing through the center thereof, a lens having an optical axis and positioned in an optical path between said memory and transfer drums, and a light source for projecting light onto said memory to illuminate said memory drum, which light is reflected from said memory drum through said lens to said transfer drum, the improvement characterized in that an optical path through said lens connecting an object point on said memory drum from which light from said light source is reflected and an image point on said transfer drum is arranged obliquely to said optical axis of said lens.

4,400,081

APPARATUS FOR CLEANING PHOTOSENSITIVE MEMBER OF ELECTROSTATIC COPYING MACHINE

Tadashi Yamashita, and Toyoo Okamoto, both of Yokohama, Japan, assignors to Ricoh Company, Ltd., Japan

Filed Jul. 20, 1981, Ser. No. 285,057
Claims priority, application Japan, Jul. 21, 1980, 55-099501; Jul. 23, 1980, 55-100866
Int. Cl.³ G03G *15/00, 15/08*
U.S. Cl. 355—15 18 Claims



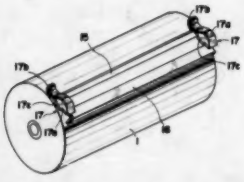
1. An apparatus for cleaning a photosensitive member of an electrostatic machine forming visible images from a dry developer in which a toner image formed on the photosensitive member is transferred to a transfer sheet in a transfer station and any residual toner is removed in a cleaning station having an element adapted to engage said photosensitive member for removing residual toner therefrom; characterized by the provision of neutralizing means electrically grounded and disposed for contact with the surface of the photosensitive member in a region between the transfer station and the element of said cleaning station.

4,400,082

CLEANING APPARATUS

Akira Kiba, Toyokawa, Japan, assignor to Minolta Camera Kabushiki Kaisha, Osaka, Japan

Filed Mar. 15, 1982, Ser. No. 358,610
Claims priority, application Japan, Mar. 20, 1981, 56-40583
Int. Cl.³ G03G *21/00*
U.S. Cl. 355—15 8 Claims



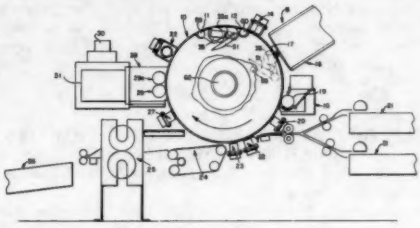
1. A cleaning apparatus for removing toner remaining on a moving photoconductive member, said apparatus comprising a resilient blade in bearing contact with the surface of the photoconductive member and reciprocatingly movable laterally of the direction of movement of the surface, a seal member provided at each end of the photoconductive member and having a width in the direction of the lateral movement of said blade equal to at least the range of lateral movement of the corresponding end of the blade, said seal member being disposed in contact with the rear surface of the blade in the range of lateral movement of the blade end, whereby toner particles are prevented from falling from the blade off the end of the photoconductive member.

4,400,083

ELECTROSTATIC PRINTER DRUM IMPROVEMENTS

James M. Beisty, Wayne; Robert J. Miller, Salford, and Albert J. Romeo, Center Square, all of Pa., assignors to Decision Data Computer Corporation, Horsham, Pa.

Filed Oct. 1, 1981, Ser. No. 307,499
Int. Cl.³ G03G *15/00*
U.S. Cl. 355—16 8 Claims



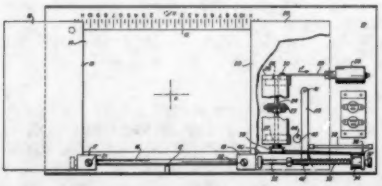
1. An electrostatic printer having a rotatable drum for advancing a photoreceptor mounted on the periphery thereof past a plurality of stations, a cathode ray tube positioned at one of said stations, said tube having its face located adjacent the periphery of said drum to project line scan images of light and shadow onto said photoreceptor whereby composite latent images are formed by the projection of successive scan images onto the photoreceptor, said printer further comprising an applicator located in the path of rotation of the drum for the application of toner in particulate form to the latent images formed by said cathode ray tube, an opening in the periphery of said drum, a wiper recessed within said opening, said wiper being mounted for movement from said recessed position to a position in which it extends beyond the periphery of the drum into a plane of contact with said means for periodically moving said tube face and means for periodically moving said wiper into said plane of contact for periodically wiping said tube face.

4,400,084

PHOTOGRAPHIC EXPOSURE MASKS

John G. Long, Leatherhead, England, assignor to Durst (U.K.) Limited, Epsom, England

Filed Dec. 7, 1981, Ser. No. 328,071
Claims priority, application United Kingdom, Dec. 22, 1980, 8041017
Int. Cl.³ G03B *27/58*
U.S. Cl. 355—74 6 Claims



1. An exposure mask for photographic material comprising a measuring wheel arranged in use to be caused to rotate by the transport of photographic material past the mask, switching means, a switching member that in use is caused to move towards and operate the switching means in response to the said rotation of the measuring wheel, and at least one adjustable covering member that in use defines an edge extending transversely of the direction of photographic material transport of an aperture through which light can reach the said

photographic material, the arrangement being such that adjustment of the position of the said covering member causes an appropriate adjustment of the angle through which in use the measuring wheel must rotate in order that the switching member shall operate the switching means.

4,400,085

SHEET SUPPLYING APPARATUS

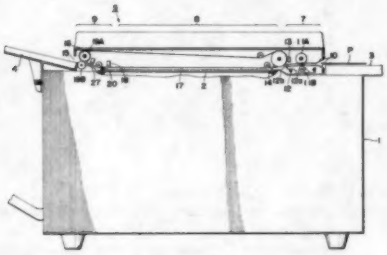
Takao Nezu, Hamura, Japan, assignor to Konishiroku Photo Industry Co., Ltd., Tokyo, Japan

Continuation of Ser. No. 209,999, Nov. 24, 1980, abandoned. This application Sep. 13, 1982, Ser. No. 417,694

Claims priority, application Japan, Nov. 27, 1979, 54-153381; Nov. 27, 1979, 54-153383

Int. Cl.³ G03B *27/62, 27/64*

U.S. Cl. 355—76 5 Claims



1. A sheet supplying apparatus comprising: a pair of supply rollers adapted to be moved into pressure contact with each other to take a sheet into the gap therebetween; a retractable gate member disposed at the inner side of the supply rollers and adapted to retain the leading end of the sheet after the latter is taken into the gap between the supply rollers; a plurality of detectors disposed between the gate member and the supply rollers, said detectors being arrayed along a line perpendicular to the direction of supply of the sheet to detect the leading end of the sheet; and control means responsive to the detectors for operating the gate member and the supply rollers so that when the leading end of the sheet is detected by all of the detectors, the control means effects movement of the supply rollers into pressure contact while retracting the gate, the control means including time delay means to start the rotation of the supply rollers so that there is commencement of supply after such movement of the rollers and retraction of the gate and to cause the time length between the detection of the sheet and the commencement of the supply to be shorter for the supply of a second and subsequent sheets than for a first sheet.

4,400,086

INSTRUMENT FOR GRINDING AND ANALYZING MATERIAL IN GROUND STATE

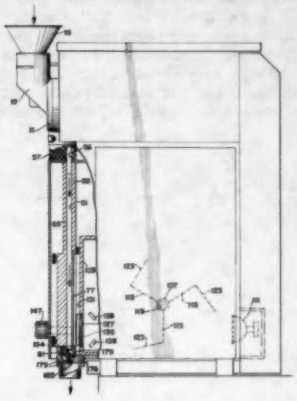
Donald R. Webster, Laurel, Md., assignor to Pacific Scientific Instruments Company, Anaheim, Calif.

Filed Jun. 4, 1979, Ser. No. 45,089

Int. Cl.³ G01N *1/20, 21/85*

U.S. Cl. 356—36 7 Claims

1. An analyzing instrument for analyzing grindable samples comprising a grinder for grinding said samples, a chute positioned to receive samples ground by said grinder, an impeller at the bottom of said chute for removing ground sample material from said chute, said chute having a window therein, measuring means to make optical measurements on the sample in said chute through said window while said impeller is removing the ground sample material from said chute, the interior walls of said chute being shaped so that there are no ledges



in said chute facing in the opposite direction of the flow of ground sample material through said chute.

4,400,087

LIGHT MEASURING CIRCUIT

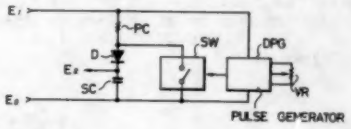
Yasuo Nakayama, No. 20-18, Shibakubo-cho 1-chome, Tanashi-shi, Tokyo, Japan

Filed May 12, 1981, Ser. No. 262,895

Claims priority, application Japan, May 13, 1980, 55-63205

Int. Cl.³ G01J *1/46;* H05B *41/14*

U.S. Cl. 356—215 10 Claims



1. A light measuring circuit comprising:

a light integrating circuit including a photodetector and an integrating capacitor and wherein the voltage across the integrating capacitor serves as a light measure output;

a switching element for controlling the integration period of the light integrating circuit; and

a pulse signal generator for supplying the switching element with pulse signals which serve as drive signals, the duty ratio of which varies with a coefficient related to a proper exposure for photographing.

4,400,088

RING INTERFEROMETER WITH AN ARRANGEMENT FOR REDUCING THE INFLUENCE OF UNDESIRED LIGHT

Gerhard Schiffner, Munich, Fed. Rep. of Germany, assignor to Siemens Aktiengesellschaft, Berlin & Munich, Fed. Rep. of Germany

Filed Aug. 21, 1980, Ser. No. 180,006

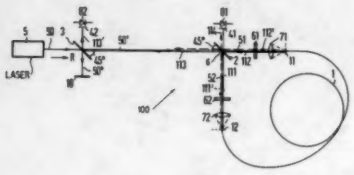
Claims priority, application Fed. Rep. of Germany, Sep. 7, 1979, 2936267

Int. Cl.³ G01C *19/64*

U.S. Cl. 356—350 2 Claims

1. In a ring interferometer having a coherent light source, at least one light sensitive surface of a detector, and a light waveguide which is wound in a coil and has two ends, each end

providing a separate coupling point at which light from the coherent source is coupled into the light waveguide and propagates to the opposite end for output coupling therefrom along separate output paths, said interferometer including means for receiving the output coupled light traveling in the two separate paths and combining portions thereof in a superimposed fashion to extend along a superimposed path leading to at least one light receiving surface, said means for combining including a unification point lying on each of said two separate output



paths, the improvements comprising each of the separate output paths having a different length between each output coupling point and the unification point with the amount of the difference of the length between the two separate output paths exceeding half the coherence length of the coherent light from said coherent light source, and the two light paths from the coherent source to each coupling point through the light waveguide to the unification point differ in length at a maximum by an amount which is smaller than the coherence length of the coherent light.

4,400,089

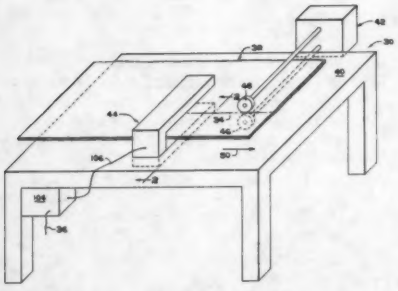
METHOD OF AND APPARATUS FOR DETERMINING OPTICAL QUALITY OF AN ARTICLE

Aloysius W. Farabaugh, Verona, Pa., assignor to PPG Industries, Inc., Pittsburgh, Pa.

Division of Ser. No. 68,832, Aug. 1, 1979, Pat. No. 4,285,745. This application Jan. 16, 1981, Ser. No. 225,541

Int. Cl.³ G01N *21/32*; G01B *11/06*

U.S. Cl. 356—382 **14 Claims**



1. A method of determining optical property of a transparent plastic sheet defined as a worked sheet exposed to heat or pressure from a transparent plastic sheet defined as an unworked sheet prior to exposure to the heat or pressure, comprising the steps of:

scanning the unworked sheet to generate an optical profile of the unworked sheet; and

altering portions of the optical profile of the unworked sheet to provide an altered optical profile which is the expected optical profile of the worked sheet.

9. An electrical system for determining optical property of a transparent plastic sheet defined as a worked sheet exposed to heat or pressure from a transparent plastic sheet defined as an unworked sheet prior to exposure to the heat or pressure, comprising:

means for scanning the unworked sheet to generate optical profile of the unworked sheet; and

means operatively connected to said scanning means for altering portions of the optical profile to provide an altered optical profile which is the expected optical profile of the worked sheet.

4,400,090

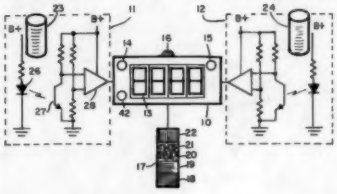
CHUGOMETER

Wesley H. Beroth, 1351 Bethania-Rural Hall Rd., Winston-Salem, N.C. 27106

Filed Sep. 4, 1981, Ser. No. 299,571

Int. Cl.³ G04F *8/00*

U.S. Cl. 368—9 **11 Claims**



1. A timing device, comprising:

first and second sensing means for providing signals indicative of the presence or absence of an object;

means for initiating a start sequence when enabled by signals from said first and second sensing means indicative of the presence of objects;

a start indicator responsive to an output of said means for initiating a start sequence; a start function generated by said start indicator;

a pulse generator for producing clock pulses; counting means activated by said start function for counting said clock pulses; and

means responsive to said first or second sensing means providing a signal indicative of the presence of an object for stopping said counting means.

4,400,091

SECOND STOP DEVICE OF CLOCK

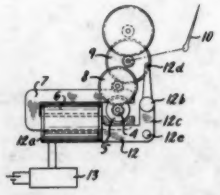
Masuo Ogihara; Nobuo Shinozaki; Tadashi Ishikawa; Toshio Yamamoto, and Yoichi Seki, all of Shikawatashi, Japan, assignors to Seiko Koki Kabushiki Kaisha, Tokyo, Japan

Filed Feb. 5, 1981, Ser. No. 231,797

Claims priority, application Japan, Feb. 5, 1980, 55/13093[U]

Int. Cl.³ G04B *19/04*

U.S. Cl. 368—80 **11 Claims**



1. A hand stopping device for a timepiece having a second hand, a minute hand and an hour hand driven by a gear train which is driven by an electromechanical transducer, the improvement comprising: said transducer having a coil frame composed of plastic material, said coil frame having an integral winding portion on which a coil is wound, and an integral arm which has an integral manually operable portion and an inte-

gral interlocking portion, the arm being configured such that when said manually operable portion is operated, the arm moves from an inoperative position in which said interlocking portion is out of engagement with said gear train to an operative position in which said interlocking portion engages with one gear of said gear train so as to stop the motion of said gear train.

4,400,092

ANALOGUE AND DIGITAL DISPLAY

Christian Piquet, and Jean-Claude Martin, both of Neuchatel, Switzerland, assignors to Centre Electronique Horloger SA, Neuchatel, Switzerland

Continuation of Ser. No. 116,460, Jan. 29, 1980, abandoned. This application Jun. 12, 1981, Ser. No. 272,944

Claims priority, application Switzerland, Feb. 8, 1979, 1228/79

Int. Cl.³ G04C *19/00, 17/02;* **G09F** *9/00*

U.S. Cl. 368—82 **7 Claims**

1. A combined analogue and digital display, comprising:

a substrate;

a plurality of first display groups disposed on said substrate, each of said first groups being radially arranged about a point and being spaced from each other by an equidistant angular amount on said substrate and each of said first groups further including a plurality of individually energizable first elongated display elements aligned linearly along a radius to form an analogue display simulating the position of at least one hand on a dial; and

a plurality of second display groups, each of said second groups including individually energizable second elongated display elements disposed on said substrate in proximity to said first elongated display elements, each of said second groups being arranged to cooperate with at least some of said first display elements to form at least two digital display arrays, each capable of selectively displaying any single digital character for displaying time.

4,400,093

METHOD FOR INSPECTING THE RUNNING OF A TIMEPIECE AND TIMEPIECE ADAPTED FOR SUCH METHOD

Jean-Pierre Jaunin, La Neuveville, Switzerland, assignor to OMEGA Louis Brandt & Frere S.A., Bienne, Switzerland

Filed Jul. 1, 1982, Ser. No. 394,061

Claims priority, application Switzerland, Jul. 6, 1981, 4422/81

Int. Cl.³ G04C *13/08;* **G04B** *27/00;* **H03K** *1/16;* **G04C** *9/00*

U.S. Cl. 368—200 **8 Claims**

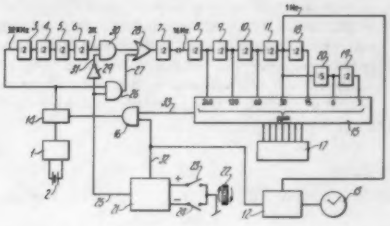
1. Method for determining the adjustment precision ΔT of an electronic timepiece having an oscillator, a frequency divider chain and an adjustment rate unit adapted to to vary the division rate of the divider chain comprising the steps of:

initially running the display at a rate n times higher than the normal rate with the adjustment unit disconnected;

measuring the real period TQ furnished by the oscillator at the output of the divider chain following a predetermined period T/n defining an adjustment cycle;

running the display a second time at a rate n times higher than the normal rate with the adjustment unit connected;

measuring the real period TQ furnished by the oscillator at the output of the divider chain following the same predetermined period T/n and corrected by the amount nΔT furnished by the adjustment unit to give a result TQ+nΔT;



calculating the difference in value of the two measurements to obtain nΔT; and

dividing said difference nΔT by the factor n thereby to obtain the adjustment precision ΔT.

4,400,094

ALARM-SETTING MECHANISM FOR TIMEPIECE WITH ESCAPEMENT PROTECTING AGAINST REVERSE ROTATION

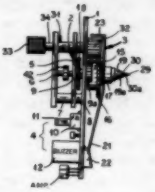
Wolfgang Fehrenbacher, St. Georgen, Fed. Rep. of Germany, assignor to Kundo-Kieninger & Obergfell, St. Georgen, Fed. Rep. of Germany

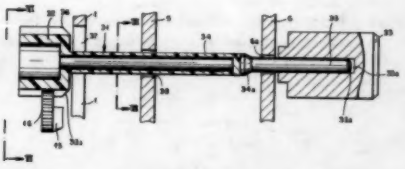
Filed Nov. 21, 1980, Ser. No. 209,275

Claims priority, application Fed. Rep. of Germany, Nov. 23, 1979, 2947244

Int. Cl.³ G04B *23/02;* **G04C** *21/00*

U.S. Cl. 368—266 **13 Claims**





1. In a timepiece provided with a clockwork, alarm means including a normally inactive signal generator, a control member coupled with a manually rotatable presetting element and juxtaposed with a coacting member of said clockwork making not more than two revolutions every 24 hours, said members being provided with mating formations alignable in one predetermined relative angular position thereof, biasing means for shifting one of said members from a normal position into an off-normal position upon alignment of said formations, and activating means operable by said one of said members in said off-normal position thereof for setting off said signal generator, interengagement of said formations preventing entrainment of said control member by said presetting element in one direction of rotation,

the imporvement wherein said presetting element is a knob fixedly secured to a flexible stem which is linked with said control member by a yieldable bidirectional coupling allowing rotation of said presetting element in either direction upon interengagement of said formations, said bidirectional coupling comprising a pinion on a free end of said stem and a set of gear teeth on said control member normally in mesh with said pinion, the latter being radially cammable out of engagement with said gear teeth by a flexing of said stem upon a rotary backstopping of said control member.

4,400,095

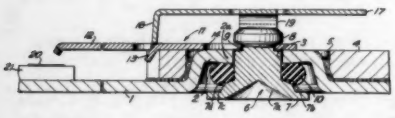
PUSH BUTTON ASSEMBLY FOR A WATCH

Wilhelm Namyslo, Pforzheim, Fed. Rep. of Germany, assignor to Timex Corporation, Waterbury, Conn.

Filed Oct. 12, 1982, Ser. No. 434,020

Int. Cl.³ G04B *29/00;* **G04C** *17/00;* **H01H** *3/12*

U.S. Cl. 368—321 **7 Claims**



1. An improved push button assembly for a watch of the type having a case member defining a recessed hole, a push button having a stem extending through said hole and a circumferential flange, the stem portion extending beyond the hole and having a circumferential groove therein, and a resilient gasket disposed between the flange and the case member, the improvement comprising:

a spring retaining clip having an extending switch blade said clip defining a keyhole opening therein with a larger diameter portion disposed to fit over the end of the push button stem and a connected smaller diameter portion adapted to fit in the groove of the stem when the spring retaining clip is slid transversely, said clip having tab retaining means adapted to snap over a portion of the case member when the clip is slid transversely,

a first electrically conductive member having a portion adapted to hold and make electrical contact with said clip in the vicinity of said retaining tab, and

a second electrically conductive member spaced from and disposed be contacted by the extending switch blade of the clip when said push button is depressed against the case member.

4,400,096

OSMOMETERS

Robert E. Molloy, 52 Cholmeley Crescent, London N6, England

Filed Jun. 1, 1981, Ser. No. 269,263

Claims priority, application United Kingdom, Jul. 16, 1980, 8023166

Int. Cl.³ G01N *25/14, 15/06*

U.S. Cl. 374—25 **6 Claims**

5. A method of determining the concentration of particles of a solute in a solvent, comprising the steps of super-cooling the solution formed by the solute and solvent and containing the super-cooled solution in a container, inserting into the solution in the container a temperature-sensitive probe provided with abrasive or cutting means, detaching particles from the interior of the container by operation of the abrasive or cutting means thereby initiating crystallisation of the super-cooled solution about the said particles acting as nuclei, and measuring the

temperature of the crystallising solution, the said temperature being a measure of the said concentration of particles.

4,400,097

SYSTEM FOR MEASURING TEMPERATURES IN PRESSURIZED REACTORS

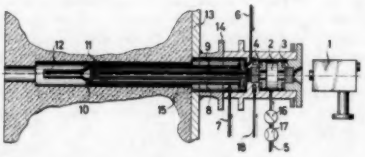
Walter Koschnitzke, and Paul Beuth, both of Oberhausen, Fed. Rep. of Germany, assignors to Ruhrchemie Aktiengesellschaft, Oberhausen, Fed. Rep. of Germany

Filed May 20, 1981, Ser. No. 265,711

Claims priority, application Fed. Rep. of Germany, Feb. 7, 1981, 3104258

Int. Cl.³ G01J *5/08, 5/48*

U.S. Cl. 374—121 **12 Claims**



1. An apparatus for the measurement of temperatures in reactors operated at high temperatures which comprises a pyrometer in optical communication with a measuring duct disposable through a wall of a reactor and in optical communication with the reactor interior, said measuring duct comprising two concentric tubes (8,9), the outer tube (8) extending beyond the inner tube (9) in the direction of the reactor interior and having a conical construction immediately following the end of said inner tube (9), said concentric tubes being provided with a common end section in the direction of the reactor exterior, said apparatus having a housing means formed in a plurality of sections including a valved housing section, a second section having a hermetic housing defining a safety chamber (2) and interiorly joined to one of said housing sections defined between two opposed pressure-tight and heat-resistant windows (3,4), said windows in optical communication with said pyrometer, said hermetic housing joined directly to said common end section of said housing means, said common end section comprising means to join the same to a reactor wall.

4,400,098
BEARING ARRANGEMENTS

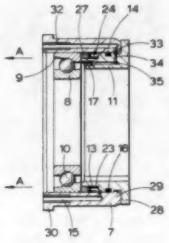
Stephen J. Lacey, Notts; Frank P. Wardle, Lincs; Thomas L. H. Walford, Newcastle upon Tyne; Samuel H. Knight; Anthony J. Kent, both of Notts, and Kenneth E. Sharman, Lincs, all of England, assignors to Ransome Hoffmann Pollard Limited, Chelmsford, England

Filed Dec. 11, 1981, Ser. No. 329,881

Claims priority, application United Kingdom, Dec. 15, 1980, 8040143

Int. Cl.³ F16C *19/06*

U.S. Cl. 384—99 **14 Claims**



1. A self-contained bearing unit for direct location in a bore of a housing wall of a machine tool to supplement another bearing or bearings in rotatably supporting a spindle; said unit comprising an angular-contact ball bearing with inner and outer races, the inner race being fixedly rotatable with the spindle, means for restraining the outer race against rotation while permitting axial displacement thereof relative to the inner race, means defining an annular pressure-fluid-reception chamber independent of the bore in the housing wall, means for permitting pressure fluid to be conveyed to said chamber, means for permitting lubricant to be conveyed to said bearing and a resiliently deformable annular U-shaped seal provided in the chamber, the seal being subjected directly to the pressure fluid conveyed to the chamber which exerts an axial displacement force on the outer race to pre-load the bearing.

4,400,099
SLIDING SURFACE BEARING FOR HEAVY LOADS

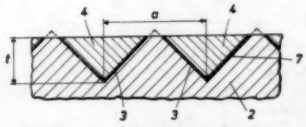
Otto Ehrentraut, Gmunden, Austria, assignor to Miba Gleitlager Aktiengesellschaft, Laakirchen, Austria

Filed Jan. 8, 1982, Ser. No. 338,062

Claims priority, application Austria, Feb. 6, 1981, 535/81

Int. Cl.³ F16C *33/24*

U.S. Cl. 384—283 **8 Claims**



1. In a sliding surface bearing for heavy loads, comprising a backing and

a bearing metal layer carried by said backing and formed with a plurality of grooves, which contain a bearing material that is softer than said bearing metal layer and together with said bearing metal layer constitutes a bearing surface which is centered on an axis, wherein said grooves are spaced transversely to a peripheral direction related to said axis and substantially surround said axis and include with said peripheral direction an acute angle of up to 15 degrees,

the improvement residing in that

the center spacing of said grooves measured at right angles to said peripheral direction is not in exces of 10 millimeters and not in excess of an upper limit

$$a_o = 250 + 0.5d + 0.01d^2$$

where a_o is expressed in micrometers and d is the effective diameter of said bearing surface in millimeters.

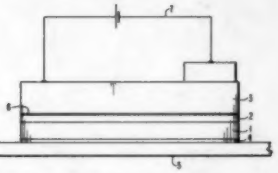
4,400,100
FOUR LAYERED RIBBON FOR ELECTROTHERMAL PRINTING

Ari Aviram, Yorktown Heights, N.Y., and Susan O. Ellmann, Lexington, Ky., assignors to International Business Machines Corp., Armonk, N.Y.

Filed Mar. 2, 1981, Ser. No. 239,781

Int. Cl.³ B41J *31/02*

U.S. Cl. 400—120 **8 Claims**



1. An improved resistive ribbon for electrothermal printing comprising,

a substrate having at one of its surfaces an ink which when heated is transferable onto a printing surface;

a metal layer on the opposing surface of said substrate,

a resistive composition layer atop said metal layer; and a bonding layer between said metal layer and said resistive layer to bond said metal and resistive layers together.

4,400,101
HIGH-QUALITY/HIGH-SPEED MATRIX PRINTING

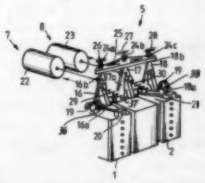
Wolfgang Hendrischk, Neu-Ulm, Fed. Rep. of Germany, assignor to Mannesmann Aktiengesellschaft, Düsseldorf, Fed. Rep. of Germany

Filed Apr. 2, 1981, Ser. No. 250,117

Claims priority, application Fed. Rep. of Germany, Jun. 10, 1980, 3022128

Int. Cl.³ B41J *3/12*

U.S. Cl. 400—124 **7 Claims**



1. In a matrix print head having at least two sets of print wires, the wires having front ends held in guide members and in vertical alignment for each set of wires, there being two guide members accordingly, the guide members being spaced apart in the direction of printing, the improvement comprising, in combination:

means for individually mounting the guide members to permit vertical displacement of each of them without lateral displacement in the direction of printing along the line and without rotation, adjacent wires in each member being spaced by a particular distance; and

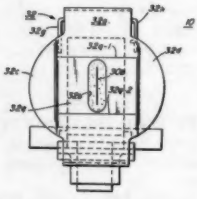
control means for displacing each one of the guide members vertically, equivalent to a displacement by less than said particular distance for each possible print position, the front ends of the wires in the two guide members being staggered before and after such displacement so that a vertical line increment of a length of said particular distance can be printed by three or more fully printed dots in two passes respectively before and after such displacement, and for relatively displacing the guide members relative to each other to obtain a horizontal alignment of the front ends of the wires so that a vertical line increment of a length of said particular distance can be printed by one dot from a wire of one of the members only for obtaining a doubling of the print speed.

4,400,102

MULTI-COLOR PRINT HEAD

John Shiurila, Londonderry, and Richard A. Williams, Hampstead, both of N.H., assignors to Centronics Data Computer Corp., Hudson, N.H.

Filed Nov. 13, 1980, Ser. No. 206,553
Int. Cl.³ B41J *3/12, 27/08*
U.S. Cl. 400—124 **3 Claims**



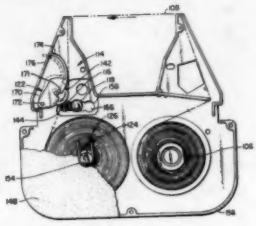
1. Apparatus for color printing comprising:
at least first and second reciprocating print elements;
first and second ink supply containers each containing ink of different colors;
first and second elongated capillary means, each having a first end extending into said ink supply container and a second end positioned to engage an associated one of said printing members, whereby ink is delivered to the printing face of the first and second printing elements by their associated capillary members to effect printing by transfer of ink from the printing face to a print receiving medium when the printing faces impact the print receiving medium, said printing elements being capable of being operated simultaneously;
each said capillary means comprising:
a first capillary member, having a tapered upper edge, provided in its associated ink container, and
a second capillary member engaging at least a portion of said first capillary member and positioned to wipingly engage its associated printing member;
means for normally biasing all of said containers in a first direction;
handle operated means for simultaneously urging all of said containers in a second direction opposite said first direction, to control the size of the area of engagement between said engaging capillary members.

4,400,103

UNIVERSAL RIBBON CARTRIDGE

James R. Daughters, Danville, Calif., assignor to Wordex, San Leandro, Calif.

Continuation-in-part of Ser. No. 80,880, Oct. 1, 1979, Pat. No. 4,307,969. This application Feb. 9, 1981, Ser. No. 232,598
The portion of the term of this patent subsequent to Dec. 29, 1998, has been disclaimed.
Int. Cl.³ B41J *33/14*
U.S. Cl. 400—208 **8 Claims**



1. In a ribbon cartridge for use in at least two types of printers, said printers having a drive shaft with a driving head formed at the outer end thereof for driving engagement with a drive gear of a cartridge, one type of printer having a drive shaft in a first location and the other type of printer having a drive shaft in a second location, the ribbon cartridge including a body having a ribbon exit arm and a ribbon entry arm, said arms defining a path for the passage of ribbon between the exit and entry arms, the ribbon in the cartridge passing from a supply spool, housed within the body, out through the exit arm, past the printer, and in through the entry arm, the improvement in said cartridge comprising:
a first drive gear mounted on the body at a first location;
a second drive gear mounted on the body at a second location and situated for rotatable engagement with said first drive gear;
said first and second drive gears defining recesses within the outer surfaces thereof, said recesses shaped for driven engagement with said driving head;
a ribbon drive gear mounted coaxially on the first drive gear and projecting into the interior of the cartridge;
an idler wheel rotatably mounted on the body and located adjacent the ribbon drive gear so that the idler wheel and ribbon drive gear coact to advance the ribbon as either the first drive gear or second drive gear is rotated; and
a take-up spool mounted on the body and rotatably coupled to the drive gears so that said advanced ribbon is collected on said take-up spool.

4,400,104

SHUTTLE PRINTER AND DRIVE MECHANISM

Charles M. McCray, Raleigh, N.C., and William A. Grubbs, Rockville, Md., assignors to International Business Machines Corp., Armonk, N.Y.

Filed Dec. 23, 1981, Ser. No. 333,598
Int. Cl.³ B41J *25/28, 19/18*
U.S. Cl. 400—320 **1 Claim**

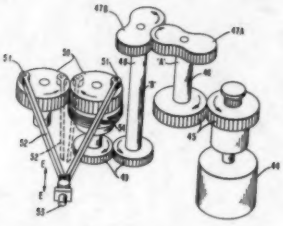
1. A dot printer comprising:
at least one printing element;
a unitary suspension spring and frame element upon which said printing element is affixed;
a platen, said platen being arranged adjacent to and parallel with said frame element on which said printing element is affixed;
said suspension spring and frame element comprising at least two comb like shaped plate springs having first, second and third legs, respectively, said first and third legs being the extreme legs and being connected to said frame forming a unitary piece therewith, said second legs thereof

being rigidly mounted to a fixed location in said printer to support said comb like shaped plate springs generally orthogonal to an intended print line and parallel with each other;

said printing element being affixed to said frame element at a position approximately colinear with the extreme first or third legs of said comb like shaped plate springs which are nearest to said print line;

a reciprocating drive means for causing linear reciprocation without orthogonal or off axis forces, said drive means being connected to said frame element and arranged with respect thereto for reciprocating the same;

said reciprocating drive means comprising a uniformly rotating electrical motor coupled to a meshed set of non-circular gears for rotating said gears, at least one of said gears



providing on an output shaft a non-uniform rotational velocity;

a matched circular set of meshed gears each having a pivot on an exposed face thereof at a fixed radial distance from the rotational axis thereof and one of said gears being connected to receive said non-uniform rotational velocity from said output shaft of said non-circular gears;

a flexible plastic yoke and drive link in the approximate shape of a "V" with the ends of said "V" being pivotally connected to said pivots on said matched circular set of gears and the point of said "V" being connected to said frame for applying reciprocal linear motion thereto as said circular gears are rotated, said motion acting along the plane parallel to the axes of said circular gear set and bisecting the distance between said axes.

4,400,105

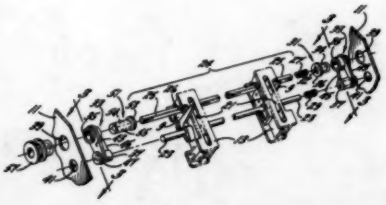
COMPUTER PRINTER PAPER TRACTOR MOUNTING MEANS

Thomas C. Yeager, St. Joseph; Douglas E. Wood, Benton Harbor, and Wayne J. Kooy, Galien, all of Mich., assignors to Printek, Inc., Benton Harbor, Mich.

Filed Oct. 16, 1981, Ser. No. 311,948

Int. Cl.³ B41J *11/30*

U.S. Cl. 400—616.1 **6 Claims**



1. In a computer printer having opposed side frame with mounting holes therein, a paper tractor mounting assembly comprising, in combination, a square drive rod and circular support rod, each rod having a first and second end; first and second mounting brackets received in the mounting holes on the inside surfaces of the side frames, each mounting bracket configured on one side for being received in the mounting holes of the respective side frame and configured on the opposite side for receiving the ends of the drive and support rods; bushing means on the first and second ends of the drive rod interposed between the drive rod ends and the mounting brackets to allow rotation of the drive rod with respect to the mounting brackets; and resilient means interposed between the first ends of each of the drive rod and support rod and the first mounting bracket to hold the drive rod, support rod, and first and second mounting brackets in place with respect to the side frames while allowing for installation and removal of the mounting assembly by first compressing the resilient means with pressure applied to the first mounting bracket and then rotating the mounting assembly.

4,400,106

TYPESETTING APPARATUS

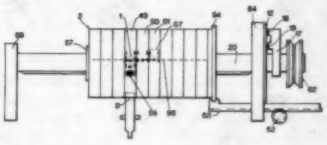
Frank J. Galland, Windsor, England, assignor to Patology Press, Ltd., Windsor, England

Filed Nov. 28, 1975, Ser. No. 635,835

Claims priority, application United Kingdom, Nov. 29, 1974, 51703/74

Int. Cl.³ B41J *15/00*

U.S. Cl. 400—617 **2 Claims**



1. An apparatus suitable for placing character images on tape comprising a rotatable drum, a circle of distributed image-forming characters on the peripheral surface of said drum, said image-forming characters oriented with lengths circumferential to said drum and in mutual typographic alignment, lands raised above the datum peripheral surface of said drum, means for rotating said drum, and means for placing an image receiving medium in the form of tape in contact with said image-forming characters and said lands in order to place character images on said tape and to advance said tape by contact between said lands and said tape.

4,400,107

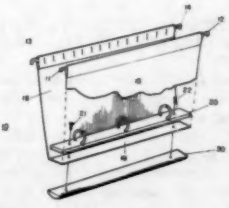
SUSPENSION FILES AND BINDERS

Warren R. Pitts, Needham, Mass., assignor to Dennison Manufacturing Company, Framingham, Mass.

Filed Jan. 29, 1981, Ser. No. 229,684

Int. Cl.³ B42F *13/26, 15/00*

U.S. Cl. 402—4 **5 Claims**



1. An improved suspension file folder of the type including a base, a plurality of leaves attached to the base, and at least one hook attached to said leaves in order to suspend the folder

from a carrier member, in which the improvement comprises a binder for the document comprising:

a platform of dimensions compatible with the base of said folder, said platform having a hinge at one end;

a plurality of rings mounted on one face of said platform to engage documents; and

a backing member pivotally attached to said platform at the hinge, said backing member having a clip to engage said platform at an end opposite said hinge,

wherein said platform is inserted within said file folder at the base so that a face of said platform opposite said rings rests against the base, and said backing member is secured to said platform with the base of said folder therebetween.

4,400,108

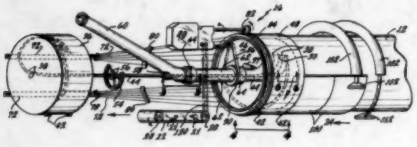
MOBILE REINFORCED CONCRETE PIPE MACHINE

Victor L. Freeman, 1325 Partridge La., Oceanside, Calif. 92054

Filed Dec. 28, 1981, Ser. No. 334,969

Int. Cl.³ E02D *29/10*; E03F *3/06*; E04G *21/12*

U.S. Cl. 405—155 **14 Claims**



1. An on site pipe forming and laying machine comprising:

a frame member movable along a pre-formed ditch;

a guide means contacting the side walls of said ditch carried by said frame member for lateral support and guiding of said machine along said ditch;

a pair of nested rotatable sleeves disposed on said frame;

supply means for supplying uncured solidifiable cementitious material between said sleeves at a selected location;

reinforcing wire supply means for supplying longitudinal and circumferential reinforcing wire within said solidifiable cementitious material;

slip form means carried by said frame, rearward of said sleeves and substantially centered along the bottom of said ditch; and

means for moving said machine along said ditch and rotating said sleeves,

whereby wire reinforced concrete pipe is formed between said sleeves and as said machine moves along said ditch newly-formed pipe exits said sleeves and is temporarily supported by said slip form means while initially curing.

4,400,109

COMPLAINT RISER YOKE ASSEMBLY WITH BREAKWAY SUPPORT MEANS

Larry L. Gentry, Sunnyvale, and Ronald I. Klootwyk, San Jose, both of Calif., assignors to Mobil Oil Corporation, New York, N.Y.

Filed Dec. 29, 1980, Ser. No. 220,922

Int. Cl.³ E21B *43/01*; F16L *1/04*

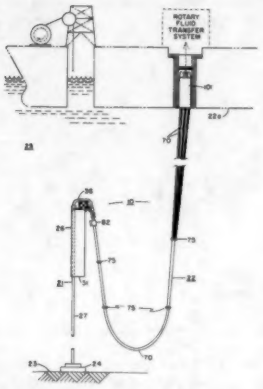
U.S. Cl. 405—195 **4 Claims**

1. In a compliant riser for connecting a marine hydrocarbon production system between a marine bottom base through a fixed-position riser section and flexible flowline section to a surface facility, the improvement which comprises:

slotted, lateral support arms mounted on the fixed riser section at a top portion thereof for receiving a yoke beam beside the fixed riser section;

yoke assembly means including said yoke beam for supporting one end of a plurality of flexible conduits in catenary arrangement and retaining said conduit ends in spaced apart positions between said lateral support arms;

releasable beam end support means at each end of said yoke beam for mounting said yoke beam adjacent the fixed riser section on a corresponding one of said lateral support arms; each of said releasable beam end support means comprising at least one laterally-projecting beam extension member extending outwardly from the beam end over a corresponding one of said lateral support arms and adapted for passing through a mating slot in said lateral support arm, and horizontally-retractable pin means disposed between each of said beam extension members and its corresponding lateral support arm, each of said pin means including a span portion overlying the corresponding support arm slot and directly supporting the corresponding beam extension member, whereby said yoke beam bears indirectly on said lateral support arms through each of said pin means;



power means for retracting each of said pin means and corresponding span portion away from the corresponding support arm slot; and

said yoke assembly means and said lateral support arms being disposed to permit said yoke assembly means to fall freely from the fixed riser section and said support arms by retracting at least one of said pin means.

4,400,110

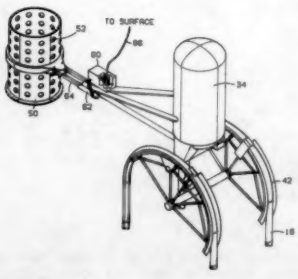
FLEXIBLE RISER UNDERWATER BUOY

Pierre A. Beynet, Tulsa, Okla., and Sam A. Billington, Houston, Tex., assignors to Standard Oil Company (Indiana), Chicago, Ill.

Filed Nov. 5, 1981, Ser. No. 318,497

Int. Cl.³ F16L *3/00*

U.S. Cl. 405—195 **6 Claims**



1. An underwater structure for supporting a flexible riser

extending from the bottom of the body of water to a floating vessel comprising:

(a) a cradle assembly having:

(i) a cradle having a receiving surface over which said riser may extend;

(ii) a buoy attached to said cradle

(b) a drag balancing tail assembly attached to said cradle assembly to counteract the twisting moment applied to said cradle assembly by current drag forces.

4,400,111

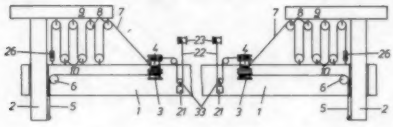
ARRANGEMENT FOR RAISING AND LOWERING A FLOATING OFFSHORE PLATFORM

Heinz Lietzke, Neuss, and Heribert K. Mayr, Mülheim, both of Fed. Rep. of Germany, assignors to Deutsche Babcock Aktiengesellschaft, Oberhausen and Schiess-Defries Hebezeug-und Transporteinrichtungen GmbH, Düsseldorf, both of, Fed. Rep. of Germany

Filed Feb. 27, 1981, Ser. No. 239,117

Int. Cl.³ E02B *17/08*

U.S. Cl. 405—196 **9 Claims**



1. An arrangement for raising and lowering a floating offshore platform, comprising: a platform with legs which are movable relatively to said platform, said legs in the operating condition being supported on the bottom of the sea; and jacking means on said platform and blocked against downward movement whenever said floating platform is at a highest point of sea wave motion in a touched-down position of said legs; said jacking means comprising two rope winches, the drive of one rope winch being switched off and the other rope winch being released in take-up direction and being blockable in payout direction in touched-down position of said legs and floating platform.

4,400,112

CONNECTING AND DISCONNECTING DEVICE FOR A GUIDE LINE

Yvon Castel, and Michel Iato, both of Pau, France, assignors to Societe Nationale Elf Aquitaine (Production), Paris, France

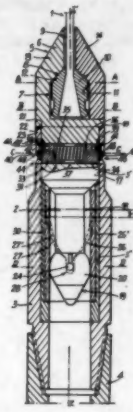
Filed Dec. 31, 1981, Ser. No. 336,415

Claims priority, application France, Jan. 13, 1981, 81 00463

Int. Cl.³ E02D *5/54, 5/74*

U.S. Cl. 405—224 **9 Claims**

1. A connection and disconnection device for a guide line (**1**) between a floating platform and an underwater installation, comprising a cylindrical adapter (**2**), attached by a connector device to the end of the guide line (**1**), and provided with a guiding and directional mechanism (**24, 25**), a longitudinal positioning surface (**21**), and at least one locking head (**40**) coming into contact respectively with guide ramps (**26, 27**), with a positioning seat (**22**), and at least one locking head slot (**44**), on the inside of a cylindrical sleeve (**3**), this sleeve (**3**) extending upwards from a guide post (**4**) fixed to the underwater installation, this locking head (**40**), constituting an extension of the locking bar (**33**) bearing on a compression spring (**37**), the lower surface of the said locking head, which forms an angle with the axis of the adapter, constituting a retracting cam, designed to come into contact with a tapering surface (**49**) cut into the inside upper edge of the sleeve (**3**), while the upper surface (**46**) of the said locking head, which is perpendicular to the axis of the adapter, forming a locking edge designed to rest on the upper edge of the locking slot (**44**), and wherein each locking head (**40**) comes into contact with a locking bar (**33**),



extended by a shearing bolt (**42**), and in that the locking slots (**44**) are formed of openings in the side of the sleeve (**3**).

4,400,113

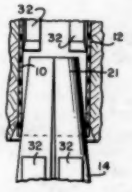
FRICTION ROCK STABILIZER AND A METHOD OF ISOLATING THE SAME FROM A BORE SURFACE

Walter M. Chaiko, Titusville, N.J., and John A. Larson, Easton, Pa., assignors to Ingersoll-Rand Company, Woodcliff Lake, N.J.

Filed Jun. 13, 1980, Ser. No. 159,184

Int. Cl.³ E21D *20/02*

U.S. Cl. 405—261 **30 Claims**



1. A method of isolating the outer surface of a friction rock stabilizer, in a closed-end earth structure bore, from the surface of the bore, comprising the step of:

interposing only a single lining, of pre-formed, plastic material, which lining has a smooth, low-friction surface, between at least a portion of the surface of the bore and the stabilizer; wherein

said interposing step comprises disposing said smooth, low-friction surface (a) in direct, contacting and only a slidable engagement with the outer surface of the stabilizer, and (b) in full circumscription of the outer surface of the stabilizer, to accommodate a relative, slidable movement between the outer surface of said stabilizer and the low-friction surface of the lining, and to insure a fully-circumscribing isolation of the outer surface of the stabilizer from the surface of the bore; and

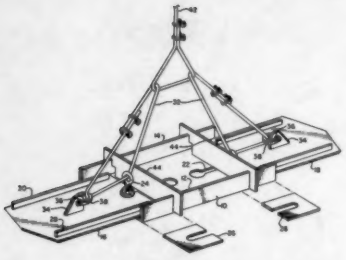
said interposing step further comprises disposing said lining in direct, contacting engagement with the surface of the bore.

4,400,114

EARTH ANCHOR APPARATUS AND METHOD

Teddy L. Pickett, Ventura, Calif., and Jerry L. Edwards, Marietta, Ga., assignors to The United States of America as represented by the Secretary of Agriculture, Washington, D.C.

Filed Feb. 3, 1982, Ser. No. 345,455
Int. Cl.³ E02D 5/74
U.S. Cl. 405—303 10 Claims



1. An extending plate earth anchor assembly for anchoring a cable at the bottom of a hole in the earth comprising in combination:

(a) a base plate;

(b) extension plates having jack lug extensions;

(c) means for locking said base plate and said extension plates together when the base plate-extension plate assembly is completed;

(d) a removable jack means for jacking said extension plates into the sides of said hole having a first end connected to one of said extension plate jack lug extensions;

(e) a removable wall bearing plate means placed between a second end of said jack means and a side of said hole for distributing the force of said jack means on the hole side wall; and

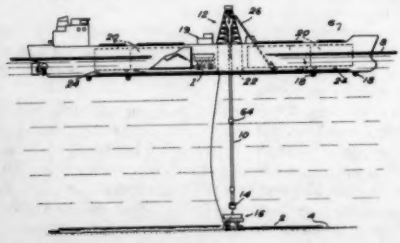
(f) cable attachment means connected to said base plate-extension plate assembly.

4,400,115

METHOD FOR DEPOSITING MATERIAL ON THE OCEAN BED AND APPARATUS FOR PERFORMING THE SAME

Pierre Biancale, Gif-sur-Yvette; Yves-Paul Corfa, Nantes; Pierre Lemercier, Grenoble, all of France; Jean-Pierre Moreau, De Panne, Belgium, and Jean Vertut, Issy les Moulineaux, France, assignors to Commissariat a l'Energie Atomique, Paris, France

Division of Ser. No. 971,193, Dec. 20, 1978. This application May 17, 1982, Ser. No. 379,144
Int. Cl.³ F02D 15/10
U.S. Cl. 405—303 10 Claims



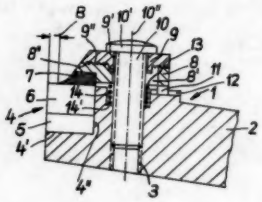
1. A vehicle for depositing materials on a pipeline placed on a sea bed, comprising: a rigid chassis to which are fixed a hopper which has an upper opening and a lower opening, at least one pair of propulsion means, each being disposed on one side of the lower opening of the hopper, motive means able to drive the propulsion means, and first detection means able to detect without contact the position variation between the vehicle and the pipeline and to control said motive means for cancelling out said variation.

4,400,116

CUTTING TOOL WITH ADJUSTABLE CHIP BREAKER

Kurt Buchmann, Essen; Heinrich Elgen, Mülheim-Ruhr, and Norbert Reiter, Mettmann, all of Fed. Rep. of Germany, assignors to Fried. Krupp Gesellschaft mit beschränkter Haftung, Essen, Fed. Rep. of Germany

Filed Jan. 26, 1981, Ser. No. 228,238
Claims priority, application Fed. Rep. of Germany, Jan. 26, 1980, 3002854
Int. Cl.³ B26D 1/00
U.S. Cl. 407—3 19 Claims



1. A cutting tool comprising a mounting shaft including an annular base; a chip breaker positioned on the mounting shaft; a cutting plate supported between the mounting shaft and the chip breaker; a clamping jaw positioned on the chip breaker; a clamping screw releasably held in the mounting shaft; said clamping screw holding the clamping jaw and the chip breaker against the mounting shaft; said clamping screw having a longitudinal axis; and a spring means for urging said chip breaker against said clamping jaw; said spring means having a first portion positioned on said annular base and a second portion normally exerting a force against said chip breaker in the direction of said axis for urging the chip breaker against said clamping jaw; said clamping jaw and said chip breaker having interengaging teeth on surfaces oriented towards one another; said chip breaker having a throughgoing aperture through which said clamping screw passes; and said throughgoing aperture being enlarged to form an elongated opening for permitting lateral movement of said chip breaker transversely to said axis.

4,400,117

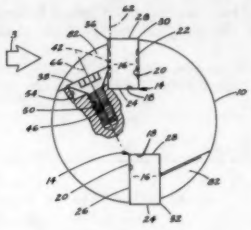
INSERT TYPE MILLING CUTTER

Theo J. Smith, Grosse Pointe Farms, Mich., assignor to Milling Specialties, Inc., Warren, Mich.

Filed May 4, 1981, Ser. No. 260,642
Int. Cl.³ B23C 5/22
U.S. Cl. 407—49 12 Claims

1. A rotary milling cutter having a body, at least one insert seat on said body, a cutting insert disposed in each such seat, each such insert having a cutting edge spaced from its seat, each insert having a first surface portion disposed against its seat and a second surface portion opposite its first surface portion, and means for releasably locking each insert in its seat comprising a pair of indentations in the second surface portion of each insert and a pair of threaded holes in the cutter body, each of said pair of threaded holes corresponding to a corresponding one of the insert indentations and having its axis disposed at an acute angle relative to the location on the second surface portion of the corresponding insert at which the

corresponding indentation is located, and a pair of fasteners each having a threaded shank threaded into a corresponding one of the pair of threaded holes, and means on the end of each fastener exterior of the corresponding hole which, upon threading of the fastener to the hole, engages the corresponding indentation thereby locking the insert in the seat, wherein each such insert has four sides extending lengthwise of the insert with adjacent sides being generally at right angles to each other, said first surface portion of each insert corresponding to two adjacent ones of said four sides and said second surface portion of each insert corresponding to the remaining



two of said four sides, said indentations being in one of said remaining two sides and spaced from each other in a direction lengthwise of the insert, said indentations being grooves each of whose length is transverse to the length of the side of the insert which contains said grooves, said grooves being parallel to each other and identical in shape, and wherein each of said grooves has a cross section transverse to its length which is of concave elliptical contour and wherein said means on the corresponding fastener engaging the elliptical contour of each groove comprises an elliptical contour of convex cross section when viewed lengthwise of the groove and corresponding to that of the groove.

4,400,118

MACHINE TOOL WITH BORE DIAMETER MEASURING APPARATUS AND TOOL POSITION COMPENSATING APPARATUS

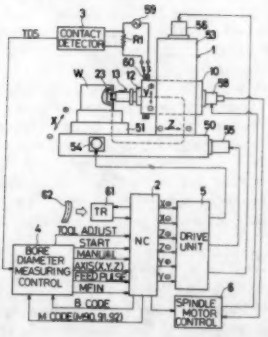
Tetsuro Yamakage, Anjo; Takao Yoneda, Toyoake, and Kohsei Imamura, Kariya, all of Japan, assignors to Toyoda Koki Kabushiki Kaisha, Kariya, Japan

Filed Jul. 9, 1981, Ser. No. 281,869

Claims priority, application Japan, Sep. 24, 1980, 55-132728

Int. Cl.³ B23B *39/08*; B23D *39/24*; G05B *19/18*

U.S. Cl. 408—3 **4 Claims**



1. A machine tool for operation on a workpiece formed with a bore to be machined comprising:

a machine body;

a work table mounted on said machine body for mounting thereon said workpiece formed with a bore to be machined;

a spindle head mounted on said machine body;

a tool spindle rotatably supported in said spindle head;

a motor drivingly connected to said tool spindle for rotating said tool spindle;

a servomotor for effecting relative movement between said work table and said tool spindle;

feed control means connected to said servomotor for controlling said servomotor in accordance with feed pulses and axis designation signals;

a tool holder receivable in said tool spindle;

a boring tool supported on said tool holder;

means provided in said tool holder for adjusting the radial position of said boring tool by utilizing rotation of said tool spindle;

a contact detecting head with a predetermined diameter secured to said tool holder in co-axial relationship therewith;

means electrically connected to said contact detecting head for detecting contact between said workpiece and said contact detecting head;

bore diameter measuring means connected between said contact detecting means and said feed control means for applying feed pulses and axis designation signals to said feed control means so as to move said tool spindle relative to said workpiece from a first position to a second position wherein at each of said first and second positions said contact detecting head contacts said workpiece, along a path passing through the center of said workpiece bore, to thereby measure the diameter of said workpiece bore; and

a motor control circuit connected to said motor for controlling said motor;

said motor control circuit being responsive to said measuring means for rotating said tool spindle to adjust the radial position of said boring tool.

4,400,119

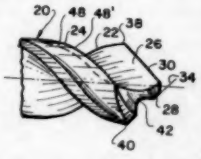
TWIST DRILL

Burke Clement, 7823 Gleason Rd., Apt. 1214, Knoxville, Tenn. 37919

Filed Aug. 10, 1981, Ser. No. 291,640

Int. Cl.³ B23B *51/02*

U.S. Cl. 408—230 **6 Claims**



1. An improved twist drill which comprises:

a pair of spiral flutes, joined by a central web, extending from a shank at a first end of said drill to first and further cutting blades at a further end of said drill, each of said cutting blades extending radially from a chisel point on the axis of said drill to a cutting lip at the peripheral edge of said flutes, each of said cutting blades defining a leading cutting edge and a trailing cutting edge;

said first cutting blade being provided with a nonconverging groove spiralling about said axis of said drill across said first cutting blade from said leading cutting edge to said trailing edge thereof at a selected position between, but removed from, said chisel point and said cutting lip of said first cutting blade;

said groove defining an inner edge toward said chisel point and an outer edge toward said cutting lip of said first blade, said inner edge having no portion at a greater radius

from said axis of said drill than said inner edge at said leading cutting edge, and said outer edge of said groove having no portion at a smaller radius from said axis of said drill than said outer edge of said groove at said leading cutting edge;

said further cutting blade having an inner portion toward said chisel point and an outer portion toward said cutting lip of said further cutting blade, said inner portion forming a symmetrical angle with said axis of said drill corresponding with said first cutting blade, and said outer portion of said further cutting blade forming an angle with said axis less than the angle of said inner portion of said further blade with said axis; and

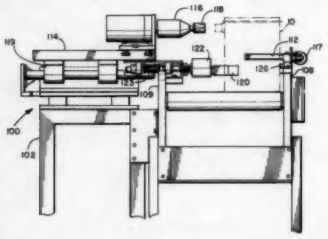
wherein the length of said outer portion of said further cutting blade, along said further cutting blade, is substantially equal to the distance between said outer edge of said groove and said cutting lip of said first cutting blade.

4,400,120

APPARATUS FOR REMOVING TEMPORARY SIDE TERMINALS FROM BATTERIES

William J. Eberle, Reading, Pa., assignor to General Battery Corporation, Reading, Pa.

Filed May 21, 1980, Ser. No. 152,090
Int. Cl.³ B23C *3/00*
U.S. Cl. 409—132 **5 Claims**



1. In an apparatus simultaneously removing temporary side post terminals from at least one multi-celled, lead acid storage battery case having a pair of said terminals, said apparatus comprising horizontally reciprocating transverse cutting means, said cutting means further comprising a plurality of multi-positionable milling heads slideably set into a work station, each of said heads further having a cutter adapted to remove a side post terminal, the method of removing said terminals, comprising:

(a) transporting said battery case into said apparatus on conveyor means to a position wherefrom said terminals may be removed wherein said transporting step further comprises:

(i) intercepting and guiding skewed or misaligned battery cases against a sidewall of said conveyor to assume a properly oriented position for said side removal operation;

(ii) periodically closing a pivotable gate to stop said battery case at a time and position within said apparatus so that said cutting means, when actuated, will properly engage said case to remove said terminals; and

(iii) opening said gate at the completion of said side terminal removal operation, so that the finished case may be transported out of the apparatus for further processing;

(b) actuating said reciprocating cutting means so that they may advance across said conveyor to engage said battery for terminal removal;

(c) sensing that said battery case is correctly positioned on said conveyor relative to said advancing milling heads, and disengaging and reversing said advancing cutting means in the event that said case is not correctly positioned;

(d) clamping said battery case within said apparatus with spring biased buffer means so that said battery case will not move during terminal removal;

(e) machining off said temporary side terminal post, by said advancing milling heads; and

(f) disengaging said milling heads by retracting said cutting means; and

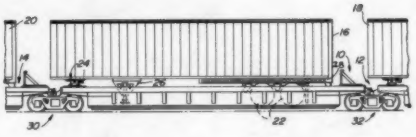
(g) transporting said machine battery cases out of said station.

4,400,121

RAILWAY CAR HITCH FOR A TRAILER

Joseph A. Krull, Philadelphia, and Michael J. Pavlick, Norristown, both of Pa., assignors to The Budd Company, Troy, Mich.

Filed Jan. 26, 1981, Ser. No. 228,377
Int. Cl.³ B60P *3/07, 7/13;* **B61D** *3/16, 45/00*
U.S. Cl. 410—64 **4 Claims**



1. A hitch mechanism for attachment to a freight car to selectively secure a locking element of a trailer to said freight car comprising:

(a) a main member;

(b) a fixed jaw member secured to said main member;

(c) a movable jaw member movably secured to said main member and spaced from said fixed jaw member to provide an opening therebetween to receive said locking element of said trailer when it is lowered into position;

(d) a manually movable lever arm pivotally connected at one end to said main member and disposed to be manually actuated at its other end and having a working portion intermediate said ends;

(e) a link element pivotally connected between said working portion of said lever arm intermediate said ends and said movable jaw member;

(f) said manually movable lever member pivoted on said main member being disposed to selectively drive said link element to move said movable jaw member to a closed position towards said fixed jaw member and to an open position away from said fixed jaw member to secure and release said locking element of said trailer;

(g) a manually movable latch mechanism pivotally mounted to said main member to automatically lock said lever member in said closed position and which manual operation of said latch mechanism is required to permit said lever member to be unlocked,

(h) said latch mechanism inlcuding a pivotable latch arm attached to said main member, said latch arm including a recess and an angular portion at one end thereof, and spring means normally biasing said latch arm in a direction to receive said lever member in said recess; and

(i) means providing an opening between said fixed and movable jaw members to receive and secure the locking element of said trailer when said hitch mechanism is closed.

4,400,122

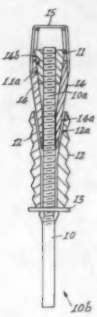
EXPANSION BOLT

Daniel Minnaar, and Clive Straughan, both of Johannesburg, South Africa, assignors to Coalequip (Proprietary) Limited, South Africa

Filed Jan. 19, 1981, Ser. No. 226,280
Int. Cl.³ F16B *13/06*
U.S. Cl. 411—67 **7 Claims**

1. An expansion bolt comprising an elongated stud member

which is adapted to provide an anchorage at its leading end in use, a plug element secured to the stud towards its remote trailing end, an expansible shell on the stud, a spacer member disposed on the stud intermediate the shell and the plug, the spacer member being comprised of a plurality of elongated



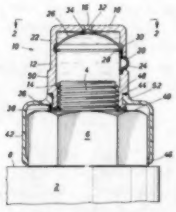
finger elements which are adapted to expand the shell radially upon movement of the plug towards the shell and deformable means coupling the ends of the finger elements adjacent the plug element together, said deformable means having sufficient strength to ensure the expansion of said shell prior to the radial expansion of said finger elements of said spacer.

4,400,123

NUT AND THREAD PROTECTOR

Ronald G. Dunegan, Katy, Tex., assignor to Rodun Development Corporation, Houston, Tex.

Filed Jul. 14, 1980, Ser. No. 168,504
Int. Cl.³ F16B *37/14*
U.S. Cl. 411—373 **19 Claims**



1. Apparatus for protecting threads from the environment, comprising:

a body member having a circular opening at one end thereof approximating the diameter of said threads and a cavity for receiving said threads,

retaining means on said body member for fixedly positioning said body member over said threads,

sealing means adjoining said opening for sealing said cavity from the environment, and

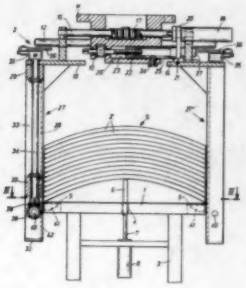
valve means carried by said body member for introducing a selected fluid under pressure into said cavity and into fluid engagement with said threads.

4,400,124

DEVICE FOR HANDLING STACKS OF FLEXIBLE OBJECTS

Peter Greller, Enkenbach, Fed. Rep. of Germany, assignor to Pfaff Industriemaschinen GmbH, Fed. Rep. of Germany

Filed May 29, 1981, Ser. No. 268,187
Claims priority, application Fed. Rep. of Germany, Jun. 27, 1980, 3024112
Int. Cl.³ B65H *29/38*
U.S. Cl. 414—43 **9 Claims**



1. A device for gripping a stack of flexible articles such as magazines, comprising a bearing plate for receiving the stack of articles, deflecting means associated with said bearing plate for deflecting the center of the articles upwardly into an arched position relative to each end of the articles, first and second gripping arms, means mounting said arms for movement in substantially horizontal directions toward and away from the respective ends of the articles to be stacked for engaging and disengaging the articles, a holding finger pivotally mounted on each of the said gripping arms being movable between a substantially horizontal position for engaging below and supporting each respective end of the articles to a vertical position to release the articles, first actuating means to move said fingers to engage and disengage from the articles, and second actuating means to move said gripping arms toward and away from the articles to engage and disengage from the respective ends of the articles, said deflecting means comprising a bar engageable with the center of said articles, means mounting said bar for upwardly and downward movement relative to said bearing plate and means for moving said bar upwardly so as to arc the stack of flexible articles resting on said bearing plate.

4,400,125

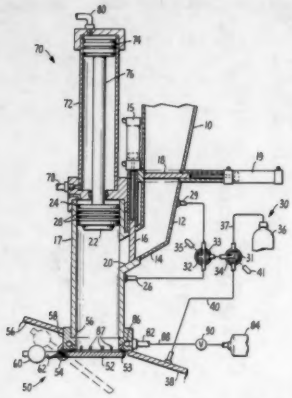
METHOD OF AND APPARATUS FOR CHARGING GROUND HYDROCARBONACEOUS MATERIAL TO A PRESSURIZED GASIFICATION SYSTEM

Harbo P. Jensen, Larkspur, Calif., assignor to Chevron Research Company, San Francisco, Calif.

Filed Jun. 12, 1981, Ser. No. 272,952
Int. Cl.³ C10J *3/30*
U.S. Cl. 414—187 **11 Claims**

1. Method of feeding comminuted ground hydrocarbonaceous material to a hydrocarbonaceous gasification reactor operating at an elevated pressure without use of a conventional lockbox which comprises filling a feed hopper by gravity and at substantially atmospheric pressure with ground hydrocarbonaceous particles of less than about 4 mesh, introducing by gravity flow the contents of said hopper into a charging cylinder interconnected between said feed hopper and the reactor, said charging cylinder having a volume greater than the volume of said feed hopper, closing off said feed hopper from said charging cylinder to enclose said charge of particles in said cylinder, introducing a predetermined volume of gas into said

charging cylinder above said charge, applying a predetermined pressure to said gas volume and through said gas volume to said hydrocarbonaceous particle charge, releasing the contents of said cylinder to said reactor in response to said predetermined pressure in said charging cylinder exceeding the pressure in said gasification reactor, and then closing said gasification reactor from said charging chamber in response to reduction of pressure in said cylinder to the pressure in said reactor to permit addition of a further charge of ground hydrocarbonaceous material from said feed hopper to said charging chamber.

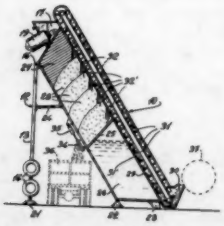


4,400,126

ROADABLE STORAGE CONTAINER FOR BITUMINOUS MIX

Bernard Desourdy, 545 de Normandie St., Longueuil, Canada J4H 3P6

Filed Aug. 13, 1981, Ser. No. 292,612
Int. Cl.³ B65G *65/32*
U.S. Cl. 414—332 **9 Claims**



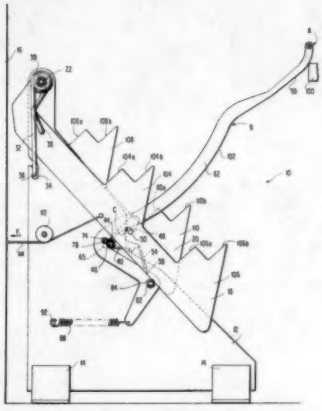
1. A roadable storage container for bituminous mix and comprising a trailer chassis and road wheel assembly, an elongated storage bin connected to the trailer chassis and road wheel assembly and defining a bituminous mix compartment and unloading outlet means in communication with the bituminous mix compartment, actuator means connected to the storage bin and operatively tilting the latter to a longitudinally-inclined operative position defining a lowermost longitudinal surface portion and an uppermost longitudinal surface portion, and conveyor means longitudinally extending lengthwise of the storage bin along the uppermost longitudinal surface portion thereof and including loading inlet means extending coextensive and in communication with the bituminous mix compartment, lengthwise of the elongated storage bin, whereby the conveyor means is constructed and arranged for progressive filling of the bituminous mix compartment through the loading inlet means, said unloading outlet means including an unloading aperture through the lowermost longitudinal surface portion communicating with the bituminous mix compartment at a lowest point thereof, and a trap door selectively opening and closing the unloading aperture.

4,400,127

TRUCK LOCKING DEVICE

Donald L. Metz, 15 Salisbury St., Cortland, N.Y. 13045

Continuation-in-part of Ser. No. 356,006, Mar. 8, 1982, abandoned. This application Jun. 11, 1982, Ser. No. 387,314
Int. Cl.³ B65G *67/02*
U.S. Cl. 414—401 **7 Claims**



1. A truck locking device comprising support means adapted to be secured on a suitable support surface, horizontally extending pivot means secured to said support means, locking arm means having at least one projection thereon pivotally mounted on said pivot means, spring means normally biasing said locking arm means upwardly for engagement with a horizontally disposed bar secured to a truck, lach means for securing said locking arm means to said support means in a lower retracted position and activating arm means pivotally mounted on said support means in operative engagement with said latch means whereby upon engagement of said bar with said activating arm means said activating arm means will be pivoted to release said latch means thereby allowing said locking arm means to pivot upwardly into locking engagement with said bar to secure the truck in position relative to said support means.

4,400,128

PALLET UNLOADING APPARATUS

Timothy H. Milligan, Beaverton, Oreg., assignor to Willamette Industries, Inc., Portland, Oreg.

Filed Apr. 21, 1981, Ser. No. 256,125
Int. Cl.³ B65B *69/00*
U.S. Cl. 414—417 **8 Claims**

1. An apparatus for unloading stacked sheet material from a support comprising:

(a) a frame structure including a station for positioning the support having the stack of sheet material thereon;

(b) forward and rearward support-engaging stops on the frame structure for limiting movement of the support in forward and rearward directions,

(c) a ram reciprocatably mounted on the frame structure at a height sufficient to pass over the support and operable to move between an advanced forward position and a retracted rearward position;

(d) sweeping means mounted on the ram and extending therebelow for frictional sweeping engagement with the sheet material and the support for pushing the support to its forward stop and then pushing the stack of sheet material from the support to the advanced forward position of the ram and for pulling the support back to its rearward stop; and

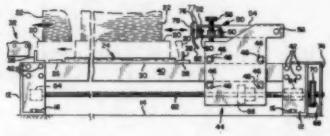
(e) drive means mounted on the frame structure for reciprocating the ram.

7. An apparatus for unloading stacked sheet material from a support comprising:

(a) a frame structure including a station for positioning the support having the stack of sheet material thereon;

(b) a ram reciprocatably mounted on the frame structure at a height sufficient to pass over the support and operable to move between an advanced position and a retracted position;

(e) a piece of flexible belting forming sweeping means at-



tached to the face of the ram and extending therebelow for frictional sweeping engagement with the sheet material and the support; and

(d) drive means mounted on the frame structure for reciprocating the ram.

8. An apparatus for unloading stacked sheet material from a support comprising:

(a) a frame structure including a station for positioning the support having the stack of sheet material thereon;

(b) a ram reciprocatably mounted on the frame structure at a height sufficient to pass over the support and operable to move between an advanced position and a retracted position;

(c) a bladder of rough material forming sweeping means mounted on the underside of the ram and extending therebelow for frictional sweeping engagement with the sheet material and the support; and

(d) drive means mounted on the frame structure for reciprocating the ram.

4,400,129

WHEELCHAIR CARRIER AND LOADING DEVICE

Jack Eisenberg, 4436 San Gabriel, Dallas, Tex. 75229, and Verlan D. Monaghen, 5817 Enchanted La., Dallas, Tex. 75227

Filed Jun. 24, 1981, Ser. No. 276,946

Int. Cl.³ B60R 9/06

U.S. Cl. 414—462 **24 Claims**

13. A wheelchair carrier for external attachment to a vehicle for lifting from the ground and carrying wheelchairs having wheels and arms externally of the vehicle, the carrier being operated by an individual, and wherein the vehicle has a central longitudinal axis extending from the front to the back of a vehicle comprising:

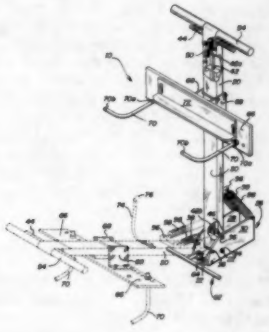
a fixed support member attached externally of the vehicle and having two side walls extending rearwardly from the vehicle, each of said side walls having first and second detents formed therein;

a pivot member being pivotally mounted to said fixed support member between said two side walls and rotatable for arcuate movement through an arc about an axis extending through said pivot member, said arc of rotation being between a pivot member vertical carrying position and a receiving position rearward of the vehicle at the end of the arc and wherein said axis is perpendicular to the central longitudinal axis of the vehicle, said pivot member having a handle thereon spaced from the pivotal mount for the individual to pivot the pivot member;

support means interconnected to said pivot member and extending rearwardly of the vehicle for receiving the arms of the wheelchair as it rests on the ground with the pivot member in the receiving position, the wheelchair carrier lifting the wheelchair off the ground as the pivot member pivots to the vertical carrying position;

clamp means interconnected to said pivot member and disposed adjacent said support means for frictionally engaging at least one arm of the wheelchair, such that at least one arm of the wheelchair is maintained between said clamp means and said support means in said pivot member vertical carrying position;

said support means in said pivot member receiving position being positionable to be placed under the arms of the wheelchair, such that as said pivot member rotates to said pivot member vertical carrying position, at least one of the arms of the wheelchair slidably engages said clamp means thereby loading the wheelchair to the wheelchair carrier with minimal effort by the user; and



a locking assembly for positively locking the pivot member to the fixed support member in the carrying and receiving positions, including:

a shaft mounted on said pivot member for limited motion along its length;

two pins mounted at one end of said shaft, each pin adjacent one of the side walls of the fixed support member;

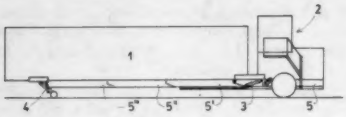
a spring interconnected between said pivot member and said shaft to urge the shaft and pins toward the fixed support member so that the pins enter the first detents in the side walls of the fixed support member to positively lock the pivot member in the receiving position and the pins enter the second detents in the side walls of the fixed support member in the vertical carrying position to lock the pivot member in the carrying position; and

a lever connected to the end of the shaft opposite the pins and proximate the handle on the pivot member so that the individual operating the wheelchair carrier can grasp the lever as he grasps the handle to move the shaft and pins from the detents for pivoting the pivot arm member between the receiving and vertical carrying positions.

4,400,130
METHOD AND APPARATUS FOR HANDLING AND TRANSPORTING A LOAD

Arjo Anttila, Tampere, and Reijo Tiitto, Pirkkala, both of Finland, assignors to Valmet OY, Finland

Filed Jun. 22, 1981, Ser. No. 276,176
Claims priority, application Finland, Jun. 24, 1980, 802015
Int. Cl.³ B60P *1/64*
U.S. Cl. 414—478 **12 Claims**



3. Apparatus for handling and transporting a load including at least one container or the like, such as between a ro/ro vessel and a terminal, comprising:

load transporting means including a frame assembly having at least two members which are longitudinally displaceable with respect to each other;

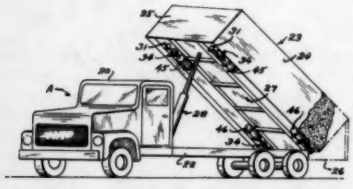
power means and a traction-providing and steering wheel assembly mounted on a first one of said frame members;

load handling means provided with said load transporting means for taking-up the load from and then depositing the load on the ground surface, said handling means including at least one load lifting means mounted on said first one of said frame members for lifting the load until a first lower edge of the load which is closest to the load transporting means is lifted from the ground surface to a loading height and at least one moveable bogie assembly mounted on a second one of said frame members which is longitudinally displaceable with respect to the first frame member so that after the load is lifted the bogie assembly is movable from an inner position adjacent to said load lifting means to an outer position beneath the load.

4,400,131
COMPRESSED AIR DISCHARGE SYSTEM FOR TRUCKS

Nolen C. Blake, Oak Hill, W. Va., assignor to The Marmon Group, Inc., Chicago, Ill.

Filed Aug. 31, 1981, Ser. No. 297,597
Int. Cl.³ B65G *11/20, 53/16;* **B65D** *88/70, 88/72*
U.S. Cl. 414—491 **12 Claims**

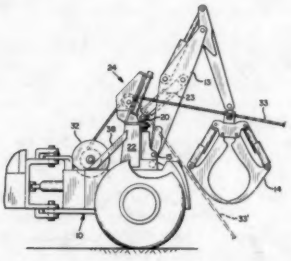


1. In a dump bed vehicle having a compressed air system including an air compressor and reservoir for maintaining a supply of compressed air, the combination with said vehicle of a compressed air discharge system for facilitating the unloading of material lodged in the dump bed thereof, said system including air tank means for receiving a supply of compressed air and conduit means having operable interconnection to said air tank means and an outlet juxtaposed to open into said dump bed for discharge of compressed air from said air tank means and into said dump bed in generating air shear planes through material lodged within said dump bed, quick release valve means having operable interconnection to said conduit means for discharge of a substantial blast of compressed air from said air tank means and into said dump bed through said outlet of said conduit means, and an air supply circuit having operable interconnection to said compressed air system of said dump bed vehicle and said air tank means for transmission of compressed air from said compressed air system of said dump bed vehicle and into said air tank means, said air supply circuit including pressure sensing valve means to sequence bleeding of compressed air from said compressed air system of said dump vehicle and into said air supply circuit as air pressure of said compressed air system of said dump bed vehicle exceeds that required for normal operation of said compressed air system of said dump bed vehicle and check valve means for preventing discharge of compressed air from said air tank means and into said compressed air system of said dump bed vehicle when the air pressure of said compressed air system of said dump bed vehicle is less than that of said air tank means.

4,400,132
SKIDDING GRAPPLE HAVING WINCH-LINE CAPABILITY

Richard R. Deline, Lake Oswego, and William R. Miner, Portland, both of Oreg., assignors to Esco Corporation, Portland, Oreg.

Filed Jun. 22, 1981, Ser. No. 275,795
Int. Cl.³ B66C *1/10, 1/42*
U.S. Cl. 414—569 **5 Claims**



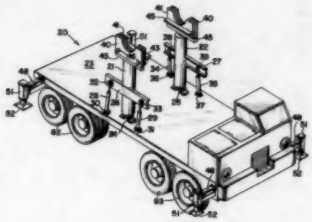
1. Load-transporting apparatus with grapple mechanism and independent load-hauling line comprising, a vehicle supported for movement over the ground, a boom on said vehicle projecting outwardly from the rear thereof, a saddle mounting the base of the boom on said vehicle accommodating horizontal swinging of the boom to permit swinging of the outer end of the boom laterally of the vehicle, and vertical swinging of the boom to permit raising and lowering of the boom's outer end, grapple mechanism swingably mounted on the boom adjacent its outer end, a fairlead assembly releasably mounted atop said saddle, a winch on said vehicle forward and below said assembly, and a winch-line reeled on said winch and extending through said fairlead assembly for connection to logs or the like independent of said boom and grapple whereby said boom is adapted to serve as a counterweight to a load secured to the free end of said winch-line, said fairlead assembly including a housing having a pair of horizontally spaced-apart rollers with said winch-line passing therebetween, said spacing being sized to pass a winch-line hook between said roller, said fairlead assembly including a generally rectangular housing having an open front and rear and defined by top, bottom and side walls, said bottom wall having bolt openings alignable with bolt holes in said saddle, said saddle including a king-post for accommodating the horizontal and vertical swinging of said boom, said assembly bottom wall bolt openings being forward of said king-post.

4,400,133

SHIPS SCREW AND RUDDER REMOVAL APPARATUS

Arthur J. Booker, Rte. 1, Box 73, Zuni, Va. 23848

Filed Sep. 9, 1981, Ser. No. 300,591
Int. Cl.³ B63B 3/00
U.S. Cl. 414—589 10 Claims



1. An apparatus for removing or replacing ships underwater parts such as a screw from the propulsion shaft or the rudder of a ship in a dry dock and transporting it from the ship to a work area comprising:

(a) a mobile vehicular frame,

(b) a pair of spaced apart main cylinder ram lifts pivoted at their base to the vehicular frame, one lying to each side of the ships part to be removed,

(c) part receiving and cradling means mounted at the upper ends of said main cylinder ram lifts,

(d) auxiliary tilt cylinder and ram means having one end pivoted to said vehicular frame and the other end pivotally connected to tilt said main cylinder ram lifts toward and away from the ships part to be removed from or replaced,

(e) hydraulic means carried by said vehicular frame for raising and lowering said vehicular frame upwardly toward and downwardly away from the ship,

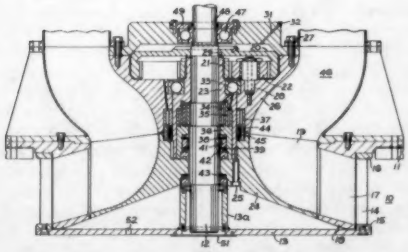
(f) and hydraulic means for longitudinally shifting said vehicular frame forwardly or rearwardly along the major axis of the ship to align the part receiving means therewith and to remove it.

4,400,134

COLLECTOR APPARATUS

William T. Sweeney, Halesowen, England, assignor to Eurotech International Limited, Cradley Heath, England

Filed Feb. 17, 1981, Ser. No. 234,752
Claims priority, application United Kingdom, Feb. 22, 1980, 8006149
Int. Cl.³ F04D 13/08, 25/16
U.S. Cl. 415—62 23 Claims



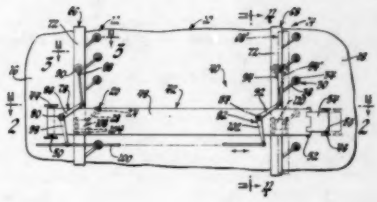
1. Pumping apparatus for collecting polluted liquids including a pumping unit comprising a stationary casing, an inlet and an outlet on said casing, a substantially vertically oriented drive shaft rotatably mounted in said casing, drive means operably connected to said drive shaft to drive said shaft about its substantially vertically oriented axis, a first pumping stage comprising a first annular rotor mounted for rotation on the lower end of said drive shaft and below said casing, forming the lower extremity of the apparatus, first blades mounted on the peripheral region of said first rotor at said inlet, shaped and operably arranged to pump liquid substantially radially inwardly with respect to the axis of rotation, stationary blades mounted on the lower extremity of said casing adjacent said inlet substantially between said first blades and said axis of rotation shaped and operably arranged to guide said liquid from said first blades substantially radially inwardly, and a further pumping stage comprising a second rotor mounted for relative rotation with respect to said casing and said drive shaft and in concentric surrounding relationship with respect to said shaft, gear means operably engaging between said drive shaft and said second rotor to drive said second rotor at higher rotational speed than said first rotor, second blades mounted on said second rotor adjacent the radially inner edges of said stationary blades shaped and arranged to pump said liquid from said stationary blades under pressure to and through said outlet.

4,400,135

VANE ACTUATION SYSTEM

Glenn W. Thebert, Carmel, Ind., assignor to General Motors Corporation, Detroit, Mich.

Filed Apr. 6, 1981, Ser. No. 251,148
Int. Cl.³ F01D 17/16
U.S. Cl. 415—134 3 Claims



1. In a gas turbine engine having an axial flow compressor including a first stage and a second stage of adjustable stator vanes disposed on a casing of said engine at axially spaced locations experiencing relative axial and radial thermal growth, an arm on each of said stator vanes for positioning each of said vanes relative to said casing, and a first actuating ring and a second actuating ring disposed around said casing at respective ones of said first and said second vane stages, an improved vane actuation system comprising, a plurality of elongated platform members each having a first end pivotally connected to said casing adjacent one of said vane stages, a plurality of compensating links each having a first end pivotally connected to said casing adjacent the other of said vane stages and a second end pivotally connected to a corresponding one of said platform members, said compensating links and said platform members cooperating with said casing in defining three-bar linkages operative to locate said platform members on said casing substantially independent of relative radial and axial thermal growth between said vane stages, connecting means between each of said arms and corresponding ones of said actuating rings operative to rigidly maintain said vanes in positions corresponding to the angular positions of said rings while permitting radial expansion of said arms relative to said actuating rings so that said rings are isolated from radial thermal growth of said casing, and ring support and drive means disposed between each of said platform assemblies and each of said actuating rings operative to maintain each of said actuating rings in centered relationship with respect to the longitudinal axis of said casing and to rotate each of said actuating rings

about the longitudinal axis of said casing to effect adjustment of said stator vanes, said ring support and drive means being further operative to maintain the positions of each of said actuating rings substantially independently of relative axial thermal growth between said first and said second stator vane stages.

4,400,136

CENTRIFUGAL PUMP IMPELLER ATTACHMENT

Kenneth W. Seyffert, Houston, Tex., assignor to Sancor Pump Co., Houston, Tex.

Filed Nov. 20, 1981, Ser. No. 323,666
Int. Cl.³ F04D *29/20*
U.S. Cl. 415—140 **10 Claims**

1. In a centrifugal pump of the end suction type and having a casing, a rotatable pump shaft in the casing and aligned with the fluid inlet or impeller mounted on the pump shaft within the casing, and means for securing the impeller in a driving mounting on the pump shaft, the improvement comprising:

(a) said pump shaft having a threaded portion between a shoulder and the end of said pump shaft adjacent the fluid inlet;

(b) said impeller having a central hub with a cylindrical opening and end faces;

(c) said hub mounted concentrically on said pump shaft with one end face resting against said shoulder and said central hub separated from said pump shaft by a cylindrical annulus;

(d) a nut with an internal threaded opening mounted on said threaded portion of said pump shaft and extending into said cylindrical annulus between said hub and said pump shaft;

(e) flange means on said nut seated against the other end face of said central hub; and

(f) key means for interconnecting said nut and said impeller for concurrent rotation on said pump shaft and said key means axially separated by unthreading said nut leaving said impeller freely rotatable on said pump shaft.

4,400,137

ROTOR ASSEMBLY AND METHODS FOR SECURING A ROTOR BLADE THEREWITHIN AND REMOVING A ROTOR BLADE THEREFROM

Arthur J. Miller, North Huntingdon, and Charles H. Kostors, Greensburg, both of Pa., assignors to Elliott Turbomachinery Co., Inc., Jeannette, Pa.

Filed Dec. 29, 1980, Ser. No. 221,076
Int. Cl.³ F01D *5/32*
U.S. Cl. 416—220 R **4 Claims**

1. A rotor assembly comprising:

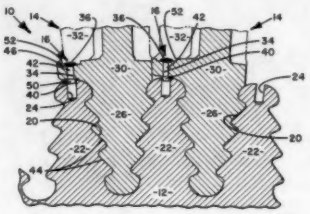
a rotor disc defining a plurality of blade grooves, and including a plurality of tenons disposed between the blade grooves and defining a plurality of pin sockets radially

a blade platform overlaying a tenon and defining a radially extending pin aperture aligned with the corresponding pin socket; and

a plurality of locking pins radially extending through the pin apertures to secure the rotor blades against axial movement, each pin including

a head projecting over and engaging an outside surface of a blade platform and

an expanded base engaging an inside surface of the blade platform to fix the pin with respect to the blade, and



a stem connecting the pin head and the pin base

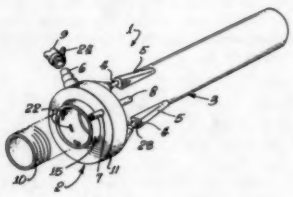
each of the expanded bases extending into and coacting with the corresponding pin socket to prevent axial movement between the blades and the disc.

4,400,138

MULTIPLE JET EDUCTOR

William F. Baer, 1509 N. Darcy, Simi Valley, Calif. 93065

Filed Oct. 19, 1981, Ser. No. 312,522
Int. Cl.³ F04F *5/46*
U.S. Cl. 417—179 **14 Claims**

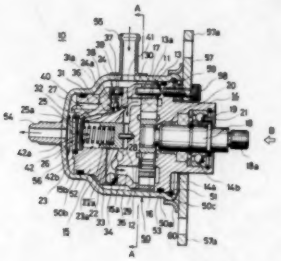


1. In a two part multiple jet pump of which a first part consists essentially of a manifold ring which is provided with a pressurized water inlet and a first plurality of radially spaced, forwardly, and convergingly, directed jet nozzles, a second part consists essentially of a tube having a bell end, said second part being provided, proximally to and at a fixed axial distance from the bell end, with a second plurality of radially disposed bosses equal in number to said first plurality, each boss containing a forwardly, and convergingly, directed porthole adapted to snugly receive a corresponding one of said jet nozzles wherein high pressure water passes through said jet nozzles and into said tube whereat said high pressure water entrains a pumped fluid and develops a low pressure, the improvement consisting of assembling the jet pump by forced simple coaxial translation motion of said first part over said bell end of said second part, all of said jet nozzles simultaneously engaging and entering corresponding ones of said portholes with transitory snake-like flexure in an intermediate position and finally penetrating to a "home position" whereat said jet nozzles revert to their originai, free of stress or distortion, molded, straight configuration, and securing said first part to said second part proximally in said "home position" by suitable means.

4,400,139
OIL PUMP

Naosuke Masuda, Higashimatsuyama; Yoshio Suzuki, Menuma, and Takeshi Ohe, Higashimatsuyama, all of Japan, assignors to Jidosha Kiki Co., Ltd., Tokyo, Japan

Filed Apr. 28, 1981, Ser. No. 258,242
Claims priority, application Japan, May 6, 1980, 55-60240
Int. Cl.³ F04B *49/08*
U.S. Cl. 417—304 4 Claims

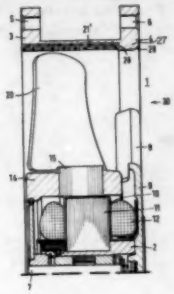


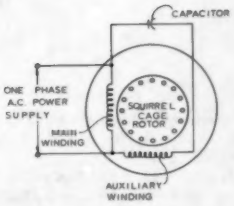
1. An oil pump comprising a casing having an inlet and an outlet for hydraulic fluid and having a pump inlet chamber adjacent said inlet and a pump outlet chamber adjacent said outlet, a rotor having a plurality of vanes, a cam ring surrounding said rotor, first and second pump bodies disposed on opposite sides of and in abutting relationship with said rotor and said cam ring, said rotor, said cam ring and said first and second pump bodies being disposed within said casing, said cam ring and said first and second pump bodies defining a pump chamber, said pump chamber having a suction side and a discharge side, said rotor being disposed inside said pump chamber for rotation therein to pump hydraulic fluid from said suction side to said discharge side, said rotor including a shaft which extends through and is rotatably supported in one of said pump bodies, a flow control valve for controlling the rate of flow of hydraulic fluid discharged through said outlet of said casing, a relief valve for maintaining the pressure of said hydraulic fluid discharged through the outlet of said casing below a predetermined value, said flow control valve and said relief valve being disposed in the other of said pump bodies, said other pump body having a first passage extending from said discharge side to said suction side of said pump chamber, said first passage having a high pressure chamber between its ends, said flow control valve being disposed in said high pressure chamber for controlling flow of hydraulic fluid through said first passage, said other pump body having a second passage extending from said discharge side of said pump chamber to said pump outlet chamber, said second passage having a first orifice of restricted size between its ends so that the pressure of the hydraulic fluid upstream from said orifice is higher than the pressure of the hydraulic fluid downstream from said orifice, said flow control valve having a low pressure chamber and an opening into said low pressure chamber, a plug plate covering said opening and having a second, damper orifice extending therethrough, said damper orifice communicating with said second passage at a location therein downstream from said first orifice so that said flow conrol valve is movable in response to the differential of the pressure in said high pressure chamber and said low pressure chamber, said other pump body having a third passage extending between and communicating with said low pressure chamber and said pump inlet chamber, said relief valve being disposed in said third passage so that said relief valve is opened when the hydraulic pressure in said low pressure chamber exceeds a selected value whereby to return the hydraulic fluid to said pump inlet chamber.

4,400,140
COMPACT FAN

Georg F. Papst, St. Georgen, Fed. Rep. of Germany, assignor to Papst Motoren KG, St. Georgen, Fed. Rep. of Germany

Continuation of Ser. No. 932,298, Aug. 9, 1978, abandoned. This application Jan. 22, 1981, Ser. No. 227,415
Claims priority, application Switzerland, Aug. 11, 1977, 9838/77
Int. Cl.³ F04B *35/04*; H02K *11/00*
U.S. Cl. 417—354 12 Claims





1. A compact fan, comprising an induction drive motor with a stator winding; a fan wheel driven by the drive motor, the fan wheel having an external diameter; a fan housing in which the drive motor is mounted; and a phase-shifting capacitor connected to the stator winding, the capacitor including conductive strips wound up together into an annulus with an internal diameter greater than said external diameter, the annulus being generally coaxial with the drive motor, the capacitor being connecting at corresponding ends of the strips to the stator winding and thereby forming a quasibifilar network connected thereto while being otherwise insulated from the drive motor, said fan housing including a part that surrounds and is generally centered about the fan wheel, said capacitor encircling the fan wheel and being mounted on said part.

4,400,141
HYDRAULIC PUMP UNIT

Jack E. Lee, Rte. 3, Box 187, and Troy G. Barrett, Rte. 3, Box 243B, both of Carthage, Tex. 75633

Filed Jun. 23, 1981, Ser. No. 276,261
Int. Cl.³ F04B *47/04*
U.S. Cl. 417—360 18 Claims

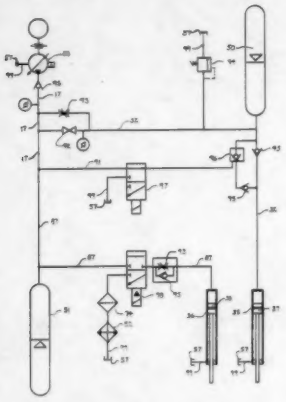
1. A hydraulic pump unit for pumping oil from oil-bearing strata in a well comprising:

(a) a stationary tray mounted on a site pad at a well location;

(b) a support frame slidably mounted on said tray and retracted on said tray while said hydraulic pump unit is in pumping configuration with respect to the well;

(c) a stationary mast vertically mounted on said support frame;

(d) a traveling mast slidably carried by said stationary mast and extensible vertically with respect to said vertical mast;
(e) bearing means carried by said stationary mast and contacting said traveling mast for stabilizing said traveling mast on said stationary mast;
(f) roller means rotatably mounted on said traveling mast near the top of said traveling mast;
(g) at least one chain having one end attached to said stationary mast and the opposite end of said at least one chain engaging said roller means and projecting downwardly in essentially parallel relationship to said stationary mast and said traveling mast;



(h) a bridle attached to said opposite end of said at least one chain and carrying a polish rod extending into the well head of the well; and
(i) a first hydraulic cylinder and a second hydraulic cylinder mounted on said support frame and attached to said traveling mast whereby said traveling mast is caused to traverse said stationary mast and said at least one chain traverses said roller means whereby the polish rod is caused to reciprocate in the well head and to pump oil from the well responsive to operation of said first hydraulic cylinder and said second hydraulic cylinder.

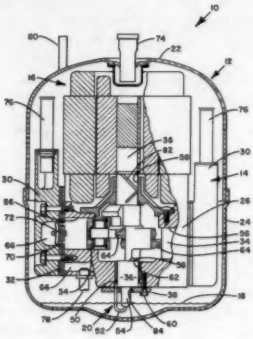
4,400,142

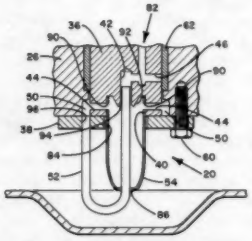
MOTOR-COMPRESSOR UNIT

Harry E. Ohlson, Jr., Syracuse, N.Y., assignor to Carrier Corporation, Syracuse, N.Y.

Filed May 4, 1981, Ser. No. 260,498
Int. Cl.³ F04B *39/02*; F01M *1/02*
U.S. Cl. 417—372 **6 Claims**

1. A motor-compressor unit comprising:
a compressor including a rotatable crankshaft;
a motor connected to the compressor crankshaft to rotate the crankshaft;
a shell enclosing the compressor and the motor;
a supply of lubricant located in the bottom of the shell; and
a lubrication system for circulating lubricant through the compressor and including
a first stage axial passage defined by and coaxial with the crankshaft, extending upward from a bottom thereof, in communication with the lubricant supply, and wherein surfaces of the crankshaft which define the first stage axial passage project around a first portion of the rotational axis of the crankshaft,
a second stage axial passage defined by and coaxial with the crankshaft, extending upward from an upper portion of the first stage axial passage, and wherein surfaces of the crankshaft which define the second stage axial passage project around a second portion of the rotational axis of the crankshaft,
a first stage radial passage defined by the crankshaft and extending radially outward from the first stage axial passage,
a second stage radial passage defined by the crankshaft and extending radially outward from the second stage axial opening,
means defining an interstage collection chamber for receiving lubricant directed outward through the first stage radial passage, and





an interstage conduit having a first end in communication with the interstage collection chamber, and extending downward therefrom and then upward through the first stage axial passage and into the second stage axial passage;
wherein rotation of the crankshaft draws lubricant from the lubricant supply, through the first stage axial passage, and into the first stage radial passage; forcibly directs the lubricant therethrough to increase the pressure of the lubricant and to direct the lubricant through the interstage collection chamber, the interstage conduit, the second stage axial passage, and into the second stage radial passage; and forcibly directs the lubricant therethrough to further increase the pressure of the lubricant.

4,400,143

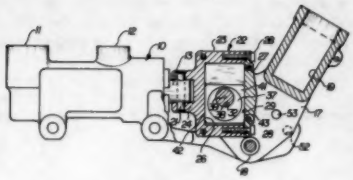
DUAL DRIVE PUMP

Terence A. O'Connor, Elyria, Ohio, assignor to Teledyne Republic Manufacturing, Cleveland, Ohio

Filed Apr. 28, 1981, Ser. No. 258,477
Int. Cl.³ F04B *35/00*
U.S. Cl. 417—374 **7 Claims**

7. A pump comprising a cylinder housing, a piston projecting into said housing reciprocable relative thereto to pump fluid, a lever pivoted in said housing, a Scotch yoke drive providing a camshaft journaled on said lever and providing a frame connected to said piston, lock means provided to lock said shaft relative to said lever when said lever is pivoted and

to lock said lever relative to said housing when said shaft is rotated, said Scotch yoke drive being operable to reciprocate



said piston in response to rotation of said shaft, pivotal movement of said lever operating to move said shaft and cause reciprocation of said piston.

4,400,144

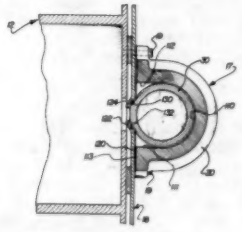
AIR COMPRESSOR

Gilbert H. Drutchas, Birmingham, and David J. Suttkus, Utica, both of Mich., assignors to TRW, Inc., Cleveland, Ohio

Filed Oct. 5, 1981, Ser. No. 308,405

Int. Cl.³ F04B *35/04, 17/08, 21/08*

U.S. Cl. 417—415 **10 Claims**



1. A fluid compressor comprising

a motor having an output shaft,

a piston housing having in it at least one recess,

a sleeve located in said recess, said sleeve having an axis extending transverse to said output shaft,

a piston located and reciprocable in said sleeve upon rotation of said output shaft,

bracket means for mounting said motor interposed between said motor and said piston housing,

resilient spring means acting between said bracket means and said sleeve and applying a biasing force against said sleeve acting in a direction transverse to the axis of said sleeve and holding said sleeve in the recess in said piston housing.

4,400,145

DRIVESHAFT ARRANGEMENT FOR A ROTARY EXPANSIBLE CHAMBER DEVICE

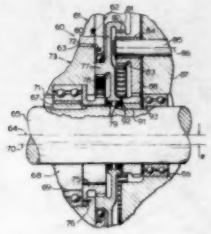
Ralph Hoffmann, Eden Prairie, Minn., assignor to Trochoid Power Corporation, Eden Prairie, Minn.

Filed Mar. 20, 1981, Ser. No. 246,099

Int. Cl.³ F04C *2/00*

U.S. Cl. 418—61 A **32 Claims**

1. A rotary expansible chamber device having a housing formed by a peripheral wall surface defining a trochoidal cavity symmetrical about a first axis, a rotor mounted in said cavity and symmetrical about a second axis parallel to but spaced from said first axis, a driveshaft means having a centerline axis coaxial with said first axis, an eccentric lobe portion connected with said driveshaft means for supporting said rotor for rotational movement about said second axis, and a phasing gear assembly for maintaining said driveshaft rotation faster than said rotor, comprising a rotor gear, concentric about said second axis and connected for rotation with said rotor, a first cluster gear wheel assembly, supported for free-wheeling rotation about said first axis and in driving connection with said rotor gear, a second cluster gear wheel assembly in driving connection with said first cluster gear wheel assembly and supported for free-wheeling rotation about a third axis spaced from said first and second axes, and a final pinion gear in driving connection with second cluster gear wheel assembly and connected to said driveshaft for rotation about said first axis, said first cluster gear wheel assembly having a first gear



and a second gear and said second cluster gear assembly wheel having a third pinion gear and a fourth pinion gear, said first gear being in gear mesh engagement with said rotor gear, said second gear being in gear mesh engagement with said third pinion gear, said fourth pinion gear being in gear mesh engagement with said final pinion gear, wherein said rotor gear is a pinion and said first gear is a ring such that said rotor gear is interior of said first gear and pitch diameter for said first gear is greater than pitch diameter for said rotor gear.

4,400,146

FLUID-OPERATED GEAR MACHINE

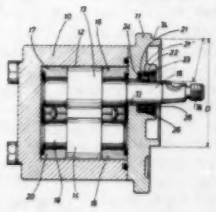
Wilhelm Dworak, Stuttgart; Karl-Heinz Müller; Siegfried Mayer, both of Vaihingen; Wolfgang Talmon, Oetisheim, and Kurt Grabow, Feucht, all of Fed. Rep. of Germany, assignors to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany

Filed Feb. 17, 1981, Ser. No. 235,132

Claims priority, application Fed. Rep. of Germany, Mar. 6, 1980, 8006057[U]

Int. Cl.³ F04C *15/00;* **F01C** *19/08*

U.S. Cl. 418—131 **9 Claims**

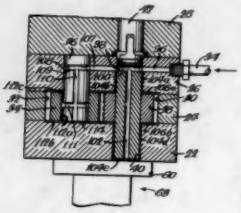


1. In a gear machine, such as a gear pump or hydraulic motor, a combination comprising a housing; a drive shaft located in said housing and having an end outwardly extended from said housing; at least two meshing gears located in said housing, one of said gears being mounted on said drive shaft; bearing means journalling said shaft for rotation and mounting the same with slight radial play; a cover having a stepped bore to receive said shaft and sealingly closing said housing; and means for aligning said shaft with said bore in a radial direction, including a centering ring located in said stepped bore with a relatively small radial play and surrounding said drive shaft.

4,400,147
FLUSHABLE ROTARY GEAR PUMP

Carl M. Springer, Park Ridge, Ill.; Bernd O. Theis, Dormagen, Fed. Rep. of Germany; Georg Wawra, and Richard Juffa, both of Cologne, Fed. Rep. of Germany, assignors to Binks Manufacturing Company, Franklin Park, Ill. and Bayer Aktiengesellschaft, Fed. Rep. of Germany

Filed Mar. 25, 1981, Ser. No. 247,610
Int. Cl.³ F01C *1/18*; F04B *49/00*
U.S. Cl. 418—206 **13 Claims**



1. In a rotary gear pump of a type for metering precise quantities of fluidic material and comprising a pump body having an inlet for connection with a supply line, an inlet chamber in communication with said inlet, an outlet for connection with a delivery line, an outlet chamber in communication with said outlet and first and second gears mounted for rotation in meshed engagement in said body, said gears meshing at a point between said inlet chamber and said outlet chamber for delivering fluidic material introduced through said inlet from said inlet chamber to said outlet chamber and said outlet, the improvement comprising first passage means in communication with said inlet and outlet; and a valve for opening and closing said first passage means, said valve including a valve stem movable into said first passage means to interrupt a path therethrough and out of said first passage means to establish a path therethrough, and motor means for moving said valve stem into and out of said first passage means, whereby upon movement of said valve stem into said first passage means said pump may be operated normally so that said gears then deliver fluidic material introduced into said inlet chamber to said outlet chamber, and upon movement of said valve stem out of said first passage means a path is established for a flow of flushing media, introduced at said inlet through the supply line, between said inlet and said outlet and through said first passage means and the delivery line to clean the same, wherein said first and second gears are mounted for rotation on respective first and second shafts in said body, and including at least a second inlet to said body separate from said first mentioned inlet, said outlet and said inlet and outlet chambers and second passage means in said body separate from said first mentioned inlet, said outlet and said inlet and outlet chambers and extending between said at least second inlet and spaces defined between adjacent surfaces of said shafts, pump body and gears, and means for connecting a supply of flushing media with said at least second inlet, whereby flushing media may be introduced at said at least second inlet and through said second passage means into said spaces to clean said adjacent surfaces of the fluidic material.

4,400,148
RECOVERY OF FINES IN AIR LAID PAPERMAKING

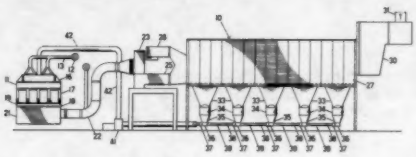
William J. Lawrence, and Patrick W. Halferty, both of Green Bay, Wis., assignors to James River-Dixie/Northern, Inc., Greenwich, Conn.

Filed May 13, 1981, Ser. No. 263,121
Int. Cl.³ D04H *1/64*
U.S. Cl. 425—155 **13 Claims**

1. Apparatus for continuously recovering the fines collected from an air laid papermaking machine at a fines separator having a plurality of separation units which discharge said fines into hoppers, comprising:

(a) selectively openable manifold conduit damper valves, each connected to the bottom of one of the hoppers, normally blocking the flow of air and fines therethrough, each damper valve being responsive to a control signal to open and allow the contents from the hoppers of the separation units to pass therethrough;

(b) transfer conduits connected to receive fines passed through the manifold conduit damper valves, the conduits



being arranged in a manifold configuration which converges to a collection conduit;

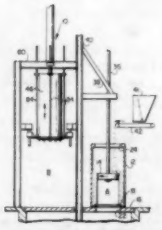
(c) a transport fan connected to the collection conduit to provide a continuous suction draw on the collection conduit and thereby on the other manifold conduits;

(d) an outlet conduit, connected to receive the air and fines mixed therewith from the transport fan, which extends to the papermaking machine and is adapted for connection to a distributor of the papermaking machine wherein fresh fiber stock is mixed with the fines.

4,400,149
CONCRETE PIPE MAKING MACHINE WITH REDENSIFICATION APPARATUS

Roger L. Toffolon, Hartford, and Warren E. Kart, Bristol, both of Conn., assignors to Roger L. Toffolon and Atlantic Pipe Corporation, both of Plainville, Conn.

Continuation of Ser. No. 204,310, Nov. 5, 1980, abandoned, which is a continuation of Ser. No. 36,297, May 7, 1979, abandoned, which is a continuation of Ser. No. 863,150, Dec. 22, 1977, abandoned. This application Feb. 5, 1982, Ser. No. 346,262
Int. Cl.³ B28B *21/14*
U.S. Cl. 425—262 **26 Claims**



1. In a machine for the "dry mix" packerhead manufacture of concrete pipe having at least two stations and at least one separable tubular jacket for the formation of pipe therewithin; the combination comprising means for supporting said jacket in a vertically open attitude at each of said stations and for transferring the jacket with a pipe formed therewithin between said stations, a rotatable cylindrical packerhead at one of said stations having an external diameter substantially less than the internal diameter of said jacket, said packerhead being axially aligned with and movable vertically within and above a jacket supported at said one station, "dry mix" delivery means associated with said packerhead at said one station for progressively depositing the mix atop the packerhead with the packerhead rotating and moving vertically upwardly within the jacket

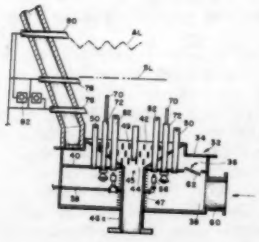
whereby to distribute the mix radially outwardly from the packerhead and to form a concrete pipe in the annular space between the jacket and the periphery of the packerhead, a radially expandable and contractable core at the other station approximately as long as the jacket and having an external diameter approximating the internal diameter of a pipe formed at said one station, power operated means for expanding and contracting said core and for moving the core vertically between first and second positions relative to a jacket and formed pipe at said other stations, the first position being vertically displaced from the jacket and the second position being within and concentric with the pipe and jacket, an annular axial alignment means at said other station adapted to be in operative association with one end of a pipe supported in a jacket at said other station, said axial alignment means having a cylindrical opening of a diameter substantially equal to the internal diameter of the pipe and serving the guide the core during vertical movement from its said first position to its second position within the pipe, said annular axial alignment means being movable between first and second positions relative to the pipe and jacket, and said axial alignment means in its first position being spaced vertically from said pipe and jacket and in its second position being adjacent said pipe and jacket and connected therewith so as to align axially with respect thereto, said power operated means serving also to contract the core during movement relative to the jacket and pipe and to expand the core into firm engagement with the internal diameter of the pipe when the core is in its said second position, and at least one vibrator operatively associated with said core for vibrating the same in its said expanded second position whereby to compact the pipe, to eliminate voids, and to relieve forming stresses therein.

4,400,150

FLUIDIZED BED COMBUSTOR DISTRIBUTOR PLATE ASSEMBLY

Willard P. Smith, and Bruce R. Hutchinson, both of Spring Lake, Mich., assignors to Stone-Platt Fluidfire Limited, England

Filed Oct. 20, 1980, Ser. No. 198,919
The portion of the term of this patent subsequent to Aug. 24, 1999, has been disclaimed.
Int. Cl.³ F23D *19/00*
U.S. Cl. 431—170 **2 Claims**



1. A fluidized bed combustor comprising:

a combustion chamber;

a distributor plate assembly at the bottom of said chamber, including a distributor plate with downwardly sloping surfaces; said surfaces having slots with vertically spaced shields thereabove to form laterally oriented air flow openings to said chamber to cause particle classification along said sloped surfaces; air flow riser tubes in addition to said shielded slots, projecting up through said surfaces to a position elevated thereabove, having air inlets at the bottom and outlets at the top;

means for supplying forced air to said slots for the three purposes of classification, fluidization, and combustion, and to said risers for the two purposes of fluidization and combustion; and

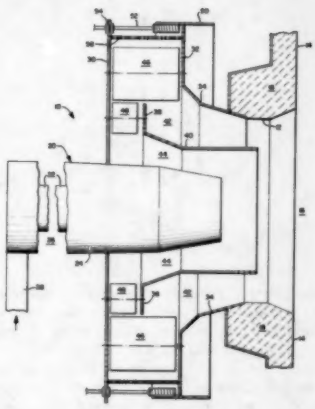
means for controlling classification of the fluidized bed independent from fluidization thereof comprising means for regulating the proportion of air flow to said slots with respect to the air flow to said riser whereby variation of the relative rate of air flow through said slots and said risers changes the classification relative to the fluidization of the fluidized bed.

4,400,151

CONTROLLED FLOW, SPLIT STREAM BURNER ASSEMBLY

Joel Vatsky, Millburn, N.J., assignor to Foster Wheeler Energy Corporation, Livingston, N.J.

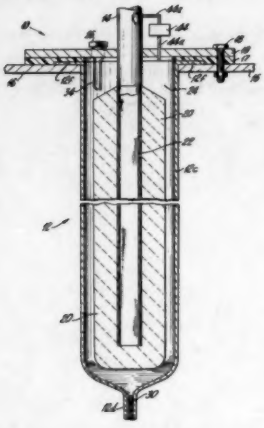
Continuation of Ser. No. 156,308, Jun. 4, 1980, abandoned. This application May 28, 1982, Ser. No. 383,227
Int. Cl.³ F23M *9/00*
U.S. Cl. 431—184 **2 Claims**



1. A burner system for a furnace comprising a plurality of burner assemblies each comprising an inner tubular member, and an outer tubular member extending around said inner tubular member in a coaxial relation thereto to define an annular fuel passage, an inlet located at one end of said fuel passage and extending tangential to said passage for introducing fuel into said passage, an outlet located at the other end of said passage for discharging said fuel, a plurality of spaced blocks disposed in said fuel passage and extending flush with said outlet, one end of each of said blocks having a curved surface against which said fuel impinges, said curved surfaces directing said fuel into the spaces between said blocks and towards said outlet for splitting up the fuel discharging from said outlet so that upon ignition of said fuel, a plurality of flame patterns are formed; and a register assembly associated with each burner assembly, each register assembly comprising an enclosure extending around a corresponding burner assembly and having an inlet for receiving air from a windbox, means for directing said air from said inlet in a radial air path towards said burner assembly, means disposed downstream of said radial air path for defining two additional air paths communicating with said radial air path, at least a portion of each of said additional air paths extending parallel in a radially spaced relationship with said fuel passage, first register means disposed in said radial air path for imparting a swirl to said air as it passes through said radial air path and second register means disposed in one of said additional air paths, said first and second register means being adjustable to regulate said swirl, and a sleeve movable across said enclosure inlet to vary the size of said inlet and the quantity of air flow through said inlet to correct for variations

in the quantity of air flow to each burner assembly caused by said regulation of said swirl, to balance the air flow to each burner assembly.

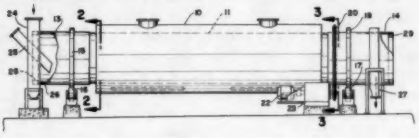
4,400,152
COMBUSTION HEATING SYSTEM
Laurence B. Craig, 116 Duck Pond Rd., Glen Cove, N.Y. 11542, and Alfred J. Farina, 1939 Anita Ct., Baldwin, N.Y. 11510
Filed Oct. 14, 1980, Ser. No. 196,573
Int. Cl.³ F23D 13/12
U.S. Cl. 431—328 **2 Claims**



1. An explosion proof heat generation and transfer device having a porous reactor for generating heat from the combustion of gas or vapor fuel, the improvement comprising:
a unitary elongated heat transfer casing,
said casing having a first portion adapted to surround the reactor and define an annular chamber between the reactor and said first portion, said first portion having an axial length at least equal to the length of the reactor,
said casing having a second portion extending axially from said first portion, said second portion having a cross-sectional area substantially less than the cross-sectional area of said first portion and an axial length equal to at least the axial length of said first portion,
combustion gases formed in said first portion having turbulent flow through said second portion,
said second portion terminating in an opening for the passage of combustion gases out of said casing, and
a coarse screen deployed within said second portion of said casing to enhance the turbulence of flow therethrough,
whereby radiated heat from the reactor is transferred through the wall of said first portion, and heat carried by the combustion gases is transferred through the wall of said second portion.

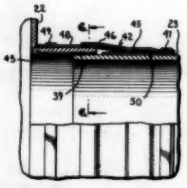
4,400,153
INDIRECTLY HEATED ROTARY CALCINER HAVING WEIGHTED CYLINDRICAL EXTENSIONS
Ford F. Miskell, 50 N. Strawberry La., Chagrin Falls, Ohio 44022
Filed Nov. 23, 1981, Ser. No. 323,818
Int. Cl.³ F27B 7/00, 6/08
U.S. Cl. 432—103 **4 Claims**

1. In an indirectly heated rotary calciner or dryer for high temperature operation in the range of 600° to 2200° F. comprising the following in combination:
A. a rotated cylinder with a heated center portion and extensions on each end;
B. a furnace surrounding said center portion;
C. two riding rings outwardly of the center portion of the cylinder;
D. trunnion rolls supporting said riding rings outwardly of the center portion of the cylinder;



E. means of driving said cylinder; and
F. breechings whereby granular particulate matter is introduced into and withdrawn from said cylinder.

4,400,154
REFUSE BURNING APPARATUS
la Clede Lientz, P.O. Box 430, Branson, Mo. 65616
Division of Ser. No. 231,163, Feb. 3, 1981, Pat. No. 4,338,868.
This application Jan. 18, 1982, Ser. No. 339,859
Int. Cl.³ F27B 7/24
U.S. Cl. 432—115 **10 Claims**



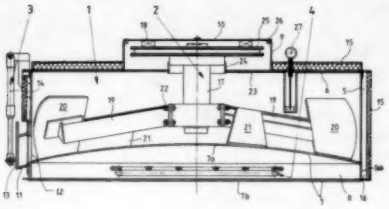
1. In a rotary furnace having a middle section rotating with respect to a head with space sufficient to allow flow of gas therebetween, the improvement comprising a sealing mechanism for the space between said middle section and said head including:
(a) a flexible upper fire resistant and generally flat strap and a lower fire resistant and generally flat strap encircling a first of said middle section or said head; said upper and lower strap each being in overlapping relationship to one another and each being securely attached to said first of said middle section or said head; and
(b) an intermediate flexible fire resistant and generally flat strap secured to and circumferentially encircling a second and opposite one of said middle section or said head; said intermediate strap extending between said upper and said lower straps so as to normally engage therewith in a sealing relationship; said intermediate strap being secured to said second one of said middle section or said head near a first circumferential edge thereof and having a second and opposite edge generally supported by the first of said middle section or said head, such that said intermediate strap seals over the space between said middle section and head during normal operation of said furnace but is free to rotate outwardly about said first edge to allow gas to escape from said furnace when a state of overpressure occurs therein;
(c) whereby oxygen is substantially restricted from passing between said middle section and said head and overpressure is relieved from said furnace.

4,400,155

EQUIPMENT FOR HEATING PULVERULENT PRODUCTS

Klaus Thesenfitz, Winsen/Luhe, Fed. Rep. of Germany, assignor to Linhoff & Thesenfitz Maschinenbau GmbH, Winsen/Luhe, Fed. Rep. of Germany

Filed Nov. 2, 1981, Ser. No. 317,026
Claims priority, application Fed. Rep. of Germany, Dec. 30, 1980, 3049520; Jan. 16, 1981, 3101308
Int. Cl.³ F27B *14/00*; F26B *9/18*; F27B *9/08*
U.S. Cl. 432—151 3 Claims



1. Apparatus for heating pulverulent products, comprising:

a cylindrical vessel having the shape of a flat drum with a diameter to height ratio of about 2:1, the vessel having a double-walled side wall, the two walls of which define an annular space between them, the outer wall being heat insulated and the inner wall being heat conducting,

a double walled bottom for the vessel, the two walls of which are spaced apart vertically, the lower bottom wall being heat insulated and the upper bottom wall being upwardly curved and heat conducting,

the vessel having an upper filling opening and a lower discharge opening for the product to be treated,

a dome-like housing mounted on top of the vessel,

a dividing wall separating the interior of the vessel from the interior of the dome-like housing,

an agitator which is symmetrical about the longitudinal axis of the vessel, the agitator including a vertical shaft passing through and being rotatably supported by the dividing wall,

two radial arms projecting from the lower end of the agitator shaft and arranged 180° apart, each arm carrying a stirrer blade near the cylindrical side wall of the vessel and a bottom scraper, one of the bottom scrapers being adjacent to the stirrer blade carried by its arm and the other bottom scraper being adjacent to the shaft, each bottom scraper having a dimension along its respective arm equal to about one half the distance between the shaft and each stirrer blade,

means for rotating the agitator shaft located within the dome-like housing,

a removable lid on the dome-like housing, means carried by the lid for supporting the agitator shaft, and a gasket between the lid and the housing for providing a seal,

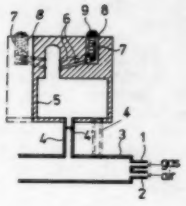
the space between the two bottom walls defining a heating chamber, heating means in the form of a ring burner within the heating chamber, the burner being supplied with fuel through pipes located within the spaces between the two side walls of the vessel, the heating chamber communicating with the lower end of the annular space between the two side walls and that space being open at its upper end.

4,400,156

GAS BURNER

Markus Frey, Regensdorf, Switzerland, assignor to Febrag AG Watt, Watt, Switzerland

Filed Nov. 17, 1981, Ser. No. 322,236
Claims priority, application Switzerland, Dec. 3, 1980, 8917/80
Int. Cl.³ F24H *1/00*; F23D *13/40*
U.S. Cl. 432—222 9 Claims



1. In a gas burner arrangement having at least one burner, and a mixing chamber for mixing entering air and fuel, in combination

means establishing a conduit between said mixing chamber and said burner, said conduit including an expansion chamber downstream of and communicating with said mixing chamber, and said conduit including a burner channel downstream of and communicating with said expansion chamber and with said burner, respectively,

whereby air and fuel entering said mixing chamber will be intermixed, and the resulting mixture will proceed therefrom through said conduit to the burner,

wherein said burner channel has an open end, said conduit further comprising a delivery passage establishing the communication between said mixing chamber and said expansion chamber, and said conduit including an intermediate passage establishing the communication between said expansion chamber and said burner channel, whereby the conduit will supply said mixture to a flame developed at the open end of said burner channel,

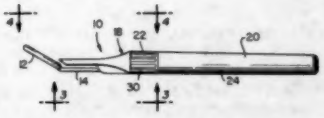
wherein each of said passages has a predetermined cross-section, the cross-section of each passage being sized so that a selected fuel mixture will have an operative velocity of the fuel mixture throughout the conduit which exceeds its ignition velocity therein.

4,400,157

DENTAL MIRROR ASSEMBLY

Charles E. Moore, 365 N. Church St., Tupelo, Miss. 38801

Filed May 12, 1982, Ser. No. 377,668
Int. Cl.³ A61C *3/00*
U.S. Cl. 433—31 4 Claims



1. A dental mirror assembly comprising: a dispensing nozzle adapted to removably receive a dental mirrorhead having a mirror surface, said dispensing nozzle having an elongated funnel shaped snout with a bore of predetermined diameter extending the length of the snout such that the combination of bore diameter and snout length form a capillary like tube for dispensing liquid in controlled droplet form; an elastomeric container for providing a liquid reservoir of a liquid defogging solution and means for removably coupling said container to

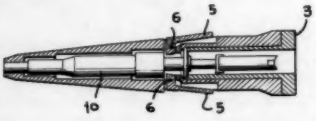
said dispensing nozzle whereby upon applying pressure to said container liquid from said container is passed into said dispensing nozzle and discharged through said snout in a relatively controlled measure.

4,400,158

CONTROL RELEASE FOR A TOOL GRIP FOR A DENTAL HANDPIECE

Philippe Garcia, Besancon, France, assignor to Micro Mega Societe Anonyme, France

Filed Jul. 23, 1981, Ser. No. 286,071
Claims priority, application France, Sep. 5, 1980, 80 19598
Int. Cl.³ A61C *1/08, 1/14*
U.S. Cl. 433—127 **8 Claims**



1. In a dental handpiece including a main body, a central rotating spindle equipped with tool grip means adjacent a forward end portion and spring means for effecting axial movement of the spindle in an inward direction for actuating said tool grip means to provide a gripping function; the improvement comprising improved release means for moving the spindle outwardly against the bias of said spring means for deactivating said tool grip means wherein said release improved means comprises a unitary plate removably mounted in the main body, first and second levers pivotally mounted on opposite sides of the plate so as to be substantially positioned within the confines of said main body and having driving ends engageable with said spindle for moving the spindle axially outwardly of the main body in response to pivotal movement of said levers inwardly of said body by a user for effecting deactivation of said tool grip means, said first and second levers being on diametrically opposite sides of the axis of the hand instrument and being mounted for pivotal movement in a plane passing through the axis of the hand instrument.

4,400,159

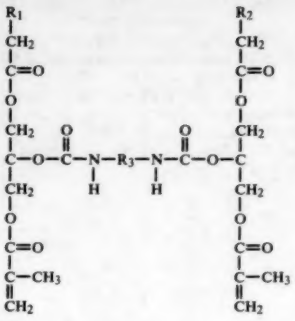
ADDUCTS OF 3-METHACROYL-2-HYDROXYPROPYL ESTERS WITH DIISOCYANATES

Jan A. Orlowski, Altadena; David V. Butler, West Covina, and Patrick D. Kidd, San Dimas, all of Calif., assignors to Scientific Pharmaceuticals, Inc., Duarte, Calif.

Continuation-in-part of Ser. No. 162,482, Jun. 24, 1980. This application May 27, 1981, Ser. No. 267,608
Int. Cl.³ A61K *6/08*
U.S. Cl. 433—202 **4 Claims**

1. A method for forming a hardened substance on teeth comprising the steps of:

(i) applying to said teeth a dental material comprising a polymerizable material, said polymerizable material comprising at least 10% by weight of a dimethacrylate of the chemical structure:



where

R_1 and R_2 may be the same or different and are cyclohexyl or phenyl groups which may be substituted or unsubstituted; and

R_3 is an aliphatic, cycloaliphatic or aromatic group having 6 to 15 carbon atoms; and

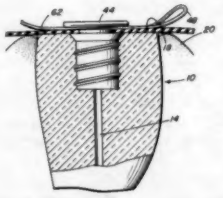
(ii) polymerizing said polymerizable material in situ.

4,400,160

ATRAUMATIC ENDODONTIC RECONSTRUCTION SYSTEM AND PROCESS

Leopold P. Lustig, 304 Greenwood St., Newton Centre, Mass. 02159, and Alfred H. Rosen, Palm Beach, Fla., assignors to Leopold Paul Lustig, Newton Ctr., Mass.

Filed Nov. 6, 1981, Ser. No. 318,935
Int. Cl.³ A61C *5/02*
U.S. Cl. 433—224 **15 Claims**



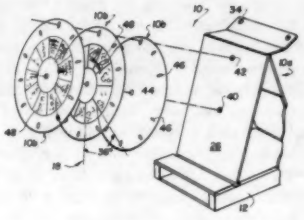
1. A grommet thimble for use in preparing a root canal of a tooth for endodontic reconstruction of said tooth comprising a tubular body of solid material having an outer diameter greater than the diameter of said root canal and an axial length which is a small fraction of the depth of said root canal for fitting into and lining an entrance hole of larger bore than the root canal in the entrance portion of the canal, said tubular body having an inner bore the diameter of which is substantially the same as the inner diameter of said canal giving access to said canal for purposes including preparation and reconstruction, including flanged-collar means at the periphery of the end which remains outside said entrance hole when said thimble is installed therein, said flanged collar means overlying an annular recess which is open for receiving and for retaining in said recess a sanitary dam having a perforation in register with said inner bore, so as to cover said tooth and the surrounding gingiva with said dam while giving access to said root canal through said perforation and said bore, and, clamp means engageable under said collar for holding said sanitary dam in a desired location.

4,400,161

GRAPHIC DISPLAY AND TONAL VALUE DETERMINATOR

Roy R. Gerlt, Clinton Woods, Tuxedo Park, N.Y. 10987

Filed Jan. 21, 1982, Ser. No. 341,251
Int. Cl.³ G09B 1/22
U.S. Cl. 434—104 **16 Claims**



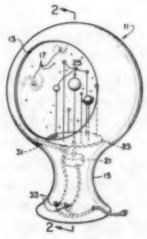
1. A container for graphic displays, comprising a container base having a top closure wall with a fold groove extending thereacross at a spaced location from one end of said top closure wall and defining a rear closure panel portion on one side of said groove and a front closure panel portion on the opposite side of said groove which is pivoted to said rear closure panel portion, an outer top cover having an inner end pivoted to said container base adjacent the rear end thereof and an opposite outer end, and an easel display support panel having an inner end pivoted to said outer end of said top cover and an outer end adapted to engage in and be propped by said fold groove.

4,400,162

PLANETARIUM

Constantine F. Rustemis, 380 Sharar Ave., Apt. #4, Opa Locka, Fla. 33054

Filed Apr. 5, 1982, Ser. No. 365,596
Int. Cl.³ G09B 27/02
U.S. Cl. 434—291 **9 Claims**



1. A miniature astronomical display comprising:

(a) an enclosure, the interior of which is viewable from appropriate positions exterior to said enclosure,

(b) a first set of representations of astronomical objects painted with phosphorescent paint and contained within said enclosure,

(c) a second set of representations of astronomical objects painted with fluorescent paint and contained within said enclosure,

(d) an ultraviolet light source positioned to illuminate said first and second sets,

(e) means for activating and deactivating said ultraviolet light source,

(f) said phosphorescent paint characterized by illumination of said first set by ultraviolet light causes said first set to glow and said glow decays but is still visible for a few minutes after said illumination terminates, and

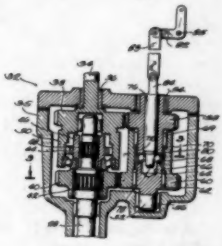
(g) said fluorescent paint characterized by illumination of said second set by ultraviolet light causes said second set to glow and said glow ceases just after said illumination terminates.

4,400,163

MARINE PROPULSION DEVICE INCLUDING AN OVERDRIVE TRANSMISSION

Clarence E. Blanchard, Kenosha, Wis., assignor to Outboard Marine Corporation, Waukegan, Ill.

Continuation of Ser. No. 12,385, Feb. 15, 1979, Pat. No. 4,323,354, Ser. No. 92,551, Nov. 8, 1979, Pat. No. 4,331,432, and Ser. No. 158,118, Jun. 11, 1980, Pat. No. 4,343,612. This application Nov. 6, 1981, Ser. No. 319,088
Int. Cl.³ B63H 5/13
U.S. Cl. 440—75 **8 Claims**



5. A transmission including a rotatably mounted input shaft, a drive shaft mounted for rotation coaxially with and independently of said input shaft, a first drive gear mounted for common rotation with said input shaft, a first driven gear mounted for common rotation with said drive shaft, clutch means drivingly connecting said input shaft to said drive shaft for affording common rotation of said input shaft and said drive shaft in one rotary direction and for permitting rotation of said drive shaft relative to said input shaft when said drive shaft is driven in said rotary direction at a rate of rotation higher than that of said input shaft, a second driven gear meshing with said first drive gear, a second drive gear mounted for rotation coaxially with and relative to said second driven gear and meshing with said first driven gear, the gear ratios of said gears being such that said drive shaft is driven at a rotational speed greater than that of said input shaft when said second driven gear and said second drive gear are drivingly connected together, and actuating means operably connected between said second driven gear and said second drive gear and movable between a first position wherein said second driven gear and said said second drive gear are freely rotatable relative to each other and a second position wherein a driving connection is established between said second driven gear and said second drive gear.

4,400,164

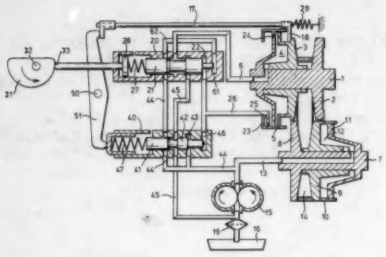
METHOD AND APPARATUS FOR CONTROLLING AN INFINITELY VARIABLE TRANSMISSION

Theodorus P. M. Cadee, Goirle, Netherlands, assignor to Van Doorne's Transmissie B.V., Tilburg, Netherlands

Filed Oct. 16, 1980, Ser. No. 197,682
Claims priority, application Netherlands, Oct. 19, 1979, 7907714
Int. Cl.³ F16H 11/06; B60K 41/12
U.S. Cl. 474—12 **4 Claims**

1. Apparatus for controlling the transmission ratio of an infinitely variable V-belt transmission of the kind having a primary input pulley and a secondary output pulley, said pulleys having conical sheaves which are mutually axially dis-

placeable by means of a primary hydraulic cylinder and a secondary hydraulic cylinder, respectively, said apparatus comprising a hydraulic valve to regulate fluid supply and discharge from and to the primary hydraulic cylinder for controlling the transmission ratio, said hydraulic valve having



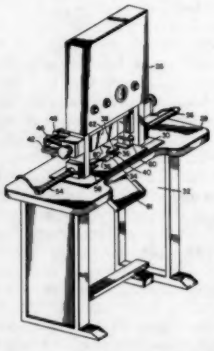
a valve body being loaded by a force depending on the speed of the primary pulley and by a force depending on an external signal, said hydraulic valve comprising additional means for loading the valve body dependent on the fluid pressure in the secondary cylinder.

4,400,165

GARMENT WELT FOLDER

Joseph W. A. Off, Irving, and Judson H. Early, Dallas, both of Tex., assignors to Haggar Company, Dallas, Tex.

Filed Oct. 13, 1981, Ser. No. 310,920
Int. Cl.³ B65H *45/12*
U.S. Cl. 493—457 **13 Claims**



1. An apparatus for mechanically folding a piece of welt material along longitudinal fold lines and along transverse fold lines comprising:

(a) a template for locating at least two longitudinal fold lines which define an area therebetween and transverse fold lines in a piece of welt material such that a first portion of the welt material is inside and two portions of the welt material are outside the area defined by the longitudinal fold lines, said template having a recessed area with longitudinal edges corresponding to the longitudinal fold lines and a slot extending transversely across the recess beyond each longitudinal edge and having predetermined dimensions;

(b) finger blade means with sharply defined edges corresponding to the longitudinal edges of the recess, said finger blade means for movement into the recess in the template and thereby positively securing the welt material between the outer edge of each finger blade means and the corresponding longitudinal edge of the recess;

(c) first moving means for moving the finger blade means between a retracted position away from the recessed area in the template to an extended position where the outer edge of each finger blade means is positioned directly above the corresponding longitudinal edge of the recess;

(d) hinged means for lowering the finger blade means onto the welt material such that the outer edge of each finger blade means secures the welt material to the corresponding longitudinal edge of the recess;

(e) two folding blades for pushing the two second portions of the welt material over the first portion of the welt material along each longitudinal fold line;

(f) a second moving means for moving the folding blades between a retracted position away from the longitudinal edge of the recessed area to an extended position over the longitudinal edge of the recessed area;

(g) plate means with a cross section corresponding to the dimensions of the slot for movement into the slot and thereby forcing a portion of the welt material snugly into the slot in such a manner as to produce a transverse fold in the longitudinally folded welt of material.

11. A method for folding a piece of welt material along longitudinal fold lines and along transverse fold lines, comprising the steps of:

(a) positioning a piece of welt material on a template having a recessed area with longitudinal edges corresponding to at least two longitudinal fold lines to be made in the welt material, and which define an area therebetween such that a first portion of the area of the welt material is inside and two second portions of the area of the welt material are outside the area defined by the longitudinal fold lines;

(b) extending a pair of finger blades each having a longitudinal edge corresponding to a longitudinal edge of the recess of the template outwardly over the welt material such that the longitudinal edge of each finger blade is positioned directly above the corresponding longitudinal edge of the recess;

(c) lowering the pair of finger blades onto the welt material such that the welt material is secured between the longitudinal edges of the finger blades and the longitudinal edges of the recessed area at the longitudinal fold lines;

(d) extending a pair of folding blades outwardly from a retracted position away from the longitudinal edge of the recessed area to an extended position over the longitudinal edge of the recessed area, such that the two second portions of the area of the welt material are folded over the first portion of the area of the welt material at each longitudinal fold line;

(e) retracting the pair of finger blades to a position away from the welt material such that the finger blades no longer secure the welt material between the longitudinal edges of finger blades and the longitudinal edges of the recessed area;

(f) raising the pair of finger blades above the surface of the recessed area;

(g) retracting the pair of folding blades from the extended to the retracted position;

(h) lowering a plate having a cross section corresponding to the cross section of a slot formed in the template and extending at least between the longitudinal edges of the recess therein into the slot and thereby forming the transverse fold in the longitudinally folded welt material; and

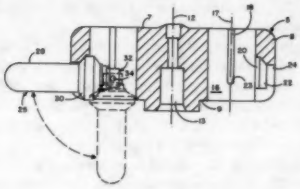
(i) raising the plate above the welt material.

4,400,166

TOP LOADING CENTRIFUGE ROTOR

Steven J. Chulay, Los Altos, and Daniel G. Crotty, San Jose, both of Calif., assignors to Beckman Instruments, Inc., Fullerton, Calif.

Filed Dec. 28, 1981, Ser. No. 334,841
Int. Cl.³ B04B 9/12
U.S. Cl. 494—20 6 Claims



1. A swinging bucket centrifuge rotor including a rotor head adapted for rotation about a vertical axis, said rotor head having top, peripheral and bottom surfaces and a plurality of chambers evenly spaced about said vertical axis, each of said chambers being constructed to receive and support a bucket on a hanger rod for pivotal movement of said bucket between a vertical position when the rotor head is stationary and a horizontal position when centrifugal force developed through rotation of said rotor head overcomes the influence of gravity on said bucket, each of said chambers comprising:

a cavity having a longitudinal axis and extending entirely through said rotor head;

a slot in the bottom of said rotor head extending from said cavity to the peripheral surface of said rotor, said slot having an upper surface and adapted to receive said bucket when it is in a horizontal position; and

a pair of opposed grooves extending part way down the wall of said cavity, the end of said grooves being situated on a horizontal line orthogonal to a vertical plane which includes said vertical axis and said longitudinal axis, the ends of said grooves forming a ledge in the wall of the cavity to support the end portions of said hanger rod and thereby enable said bucket to pivot under centrifugal force upwardly into said slot in said rotor head.

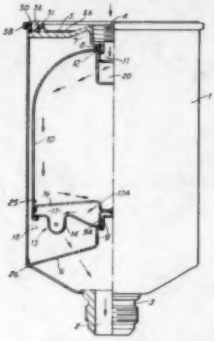
4,400,167

CENTRIFUGAL SEPARATOR

Rodney T. Beazley, Maidstone, and Mervyn T. Haggett, Langport, both of England, assignors to The Glacier Metal Company Limited, Middlesex, England

Continuation-in-part of Ser. No. 70,617, Aug. 29, 1979, Pat. No. 4,288,030. This application Apr. 13, 1981, Ser. No. 253,291
Claims priority, application United Kingdom, Apr. 11, 1980, 8012059
The portion of the term of this patent subsequent to Sep. 8, 1998, has been disclaimed.
Int. Cl.³ B04B 9/00
U.S. Cl. 494—49 6 Claims

1. In a disposable centrifugal separator for separating contaminants from oil used for lubricating an engine, said separator comprising shroud means defining a first chamber, bearing means within the shroud means, a hollow rotor rotatably carried by the bearing means, said hollow rotor defining a second chamber for receiving contaminated oil, inlet port means in said shroud means which port means is aligned with said bearing means and arranged to form a releasable connection with said engine, an inlet passage passing through said bearing means and connecting said inlet port means and said second chamber, means to rotate said rotor and thereby cause contaminants in the contaminated oil within said second chamber to migrate towards the side wall of said second chamber under the influence of centrifugal force and to be separated from such contaminated oil, said means to rotate said rotor comprising outlet reaction port means on said rotor in fluid communication with said second chamber to cause said rotor to rotate upon discharge of fluid from said second chamber to said first chamber, partition means in said second chamber adjacent said outlet port reaction means dividing said second chamber into a centrifuging chamber and an outlet port chamber, said centrifuging chamber and said outlet port chamber being interconnected adjacent the rotary axis of the rotor, and outlet port means in said shroud means for discharging fluid from said first



chamber, said outlet port means being arranged to form a releasable connection with said engine, the improvement wherein said partition means cooperates with said side wall to provide a peripheral channel at the lower end of said centrifuging chamber, and said bearing means comprises a spingle extending longitudinally of said first chamber and providing said passage and a spider secured within said shroud in the bottom region thereof supporting the lower end of said spindle.

4,400,168

ADJUSTABLE SURGICAL SUCTION APPARATUS

Frederick F. Buechel, Irvington; Michael J. Pappas, Caldwell, and Paul A. Witte, Hopewell, all of N.J., assignors to Biomedical Engineering Corp., Red Bank, N.J.

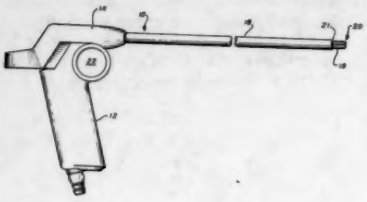
PCT No. PCT/US81/00605, § 371 Date Sep. 8, 1981, § 102(e) Date Sep. 8, 1981, PCT Pub. No. WO81/03125, PCT Pub. Date Nov. 12, 1981
Continuation-in-part of Ser. No. 148,042, May 8, 1980, abandoned. This PCT application May 7, 1981, Ser. No. 308,773
Int. Cl.³ A61M 31/00, 1/06
U.S. Cl. 604—48 13 Claims

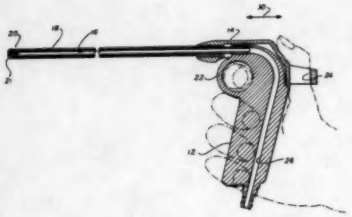
1. Surgical suction apparatus for applying suction to surgical debris to clear a surgical wound, said apparatus for being connected to a suction source, comprising:

suction means including a first tube terminating at its forward and in a generally cylindrical filter provided with a plurality of radially disposed suction holes providing an entrance aperture through which said suction is applied to said surgical debris and terminating at its rearward end in an exit aperture through which surgical debris sucked through said entrance aperture exits said apparatus, and

control means including a second tube coaxially surrounding said first tube and mounted for sliding, reciprocating, translating movement relative to said first tube to permit portions of said second tube to engage any surgical debris

lodged in said entrance aperture to clear said entrance aperture and to permit portions of said second tube to





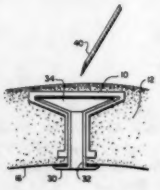
alternately cover and uncover said suction holes to vary the effective size of said entrance aperture.

4,400,169

SUBCUTANEOUS PERITONEAL INJECTION CATHETER

Robert L. Stephen, Salt Lake City, Utah, assignor to University of Utah Research Foundation, Salt Lake City, Utah

Filed Oct. 27, 1980, Ser. No. 200,830
Int. Cl.³ A61M *25/00*
U.S. Cl. 604—49 **16 Claims**



1. A subcutaneously implantable injection conduit for injecting a drug into a peritoneal cavity, comprising:

a hollow receptacle for receiving the drug, the hollow receptacle being formed as an open-top chamber;

a penetrable membrane over the open top of the chamber;

a hollow stem having a proximal end and a distal end, the proximal end of the stem being attached to the receptacle such that the stem forms a passageway extending from the chamber, the stem having a length sufficient that the stem penetrates the parietal peritoneal membrane and extends into the peritoneal cavity; and

a diametrally enlarged flange attached to the stem such that, when the conduit is implanted under a layer of skin adjacent the peritoneal cavity and the flange is secured adjacent the parietal peritoneal membrane, the distal end of the hollow stem is directed toward the mesenteric peritoneal membrane.

7. A method for injecting a drug into a peritoneal cavity in a direction toward the mesenteric peritoneal membrane, the method comprising the steps of:

obtaining an injection conduit, comprising:

a shallow vessel with an open top;

a penetrable membrane covering the open top of the vessel;

a hollow stem having a proximal end and a distal end, the proximal end of the stem being attached to the vessel such that the stem forms a passageway extending from the vessel; and

a diametrally enlarged flange attached to the stem such that, when the conduit is implanted underneath a layer of skin adjacent the peritoneal cavity and the flange is secured adjacent the parietal peritoneal membrane, the distal end of the hollow stem is directed toward the mesenteric peritoneal membrane;

implanting the injection conduit underneath a layer of skin adjacent the peritoneal cavity with the membrane being generally parallel to the skin, the hollow stem penetrating the parietal peritoneal membrane and extending into the peritoneal cavity, the diametrally enlarged flange being secured adjacent the parietal peritoneal membrane, the distal end of the hollow stem being directed toward the mesenteric peritoneal membrane, and the passageway communicating between the vessel and the peritoneal cavity; and

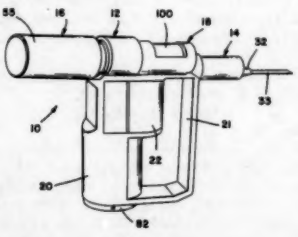
injecting a drug into the peritoneal cavity by penetrating the layer of skin and the penetrable membrane with a hollow needle and forcing the drug through the hollow needle into the vessel with the hollow stem carrying the drug into the peritoneal cavity in a direction toward the mesenteric peritoneal membrane.

4,400,170

IMPLANTING DEVICE AND IMPLANT MAGAZINE

Allen D. McNaughton, Mountain View; Stephen B. Albert, Redwood City, and Gerard A. Furbershaw, Santa Clara, all of Calif., assignors to Syntex (U.S.A.) Inc., Palo Alto, Calif.

Filed Sep. 29, 1981, Ser. No. 306,850
Int. Cl.³ A61M *5/00*
U.S. Cl. 604—62 **23 Claims**



1. An implant magazine comprising a generally cylindrical body having a plurality of longitudinally extending open channels about the circumference thereof, each of said channels being open along the entire length thereof and having means associated therewith for retaining implants within said channels prior to implantation and for increasing the size of said channels to release the implants during the implantation step, thereby substantially eliminating crushing or breaking of the implants.

4,400,171

NEEDLE-LESS INJECTION INSTRUMENT

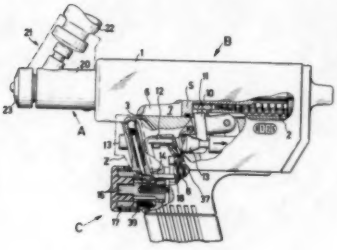
Hans-Jürgen Dettbarn, Marburg/Lahn, and Josef Zimmermann, Sulzbach, both of Fed. Rep. of Germany, assignors to Hoechst Aktiengesellschaft, Frankfurt am Main, Fed. Rep. of Germany

Filed Apr. 14, 1982, Ser. No. 368,217

Claims priority, application Fed. Rep. of Germany, Apr. 16, 1981, 3115374

Int. Cl.³ A61M 5/30

U.S. Cl. 604—68 3 Claims



1. A needle-less injection instrument with a piston pump for the medium to be injected, which is connected to a drive motor, of which the working piston, supported on a working spring, is arranged displaceably in a cylindrical bore of the motor housing, there being formed in the cylindrical bore a pressure chamber for receiving a pressure medium to tension the working spring, which has supply and discharge devices for the pressure medium, the working spring being held in a tensioned position by a pawl supported by a bolt, and the bolt being supported on an operating element, wherein the operating element C is connected rigidly to the bolt (13), and the bolt (13) is arranged displaceably in the motor housing (1).

4,400,172

NEEDLE-LESS INJECTION INSTRUMENT

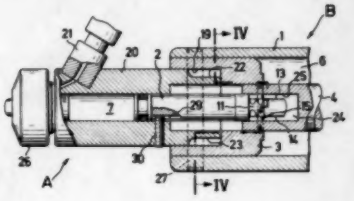
Hans-Jürgen Dettbarn, Marburg/Lahn, and Josef Zimmermann, Sulzbach, both of Fed. Rep. of Germany, assignors to Hoechst Aktiengesellschaft, Frankfurt am Main, Fed. Rep. of Germany

Filed Apr. 14, 1982, Ser. No. 368,169

Claims priority, application Fed. Rep. of Germany, Apr. 16, 1981, 3115373

Int. Cl.³ A61M 5/30

U.S. Cl. 604—10 2 Claims



1. A needle-less injection instrument with a piston pump for the medium to be injected and with a drive motor for the piston pump, the working piston of which is arranged displaceably in a cylindrical bore of the motor housing and has a piston shaft, the pump housing being connected releasably to the motor housing and the pump plunger of the piston pump being connected releasably to the piston shaft, wherein

(a) the pump housing (20) has on the pump head (17) an annular groove (18) and a pair of flattened portions (22, 23) which are parallel to one another and which reach to the bottom of the annular groove (18);

(b) the pump plunger (2) on the peg (8) projecting from the pump chamber (7) of the pump housing (20) is provided with two equally deep annular grooves (9, 10) located next to one another and with two pairs of flattened portions (11, 12, 13, 14) which are each parallel to one another and which reach to the bottom of the annular grooves (9, 10), one pair of flattened portions (11, 12 or 13, 14) extending only from the annular groove (9) to the annular groove (10) and being arranged perpendicularly to the second pair of flattened portions;

(c) two pins (15, 16, 27, 28) are arranged, parallel to one another, respectively in the motor housing (1) and in a bore (19) in the piston shaft (4) and engage into the annular groove (18) of the pump housing (20) and the annular grooves (9) and (10) of the pump plunger (2); and

(d) the pump plunger (2) and the piston shaft (4) are provided with devices preventing them from rotating in their housings.

CHEMICAL

4,400,173

BLEACH COMPOSITION CONTAINING WEAKLY TO NON-COLORED PORPHINE PHOTO-ACTIVATOR

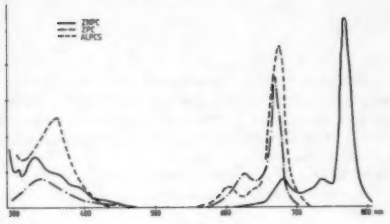
Stuart W. Beavan, Birkenhead, England, assignor to Lever Brothers Company, New York, N.Y.

Filed Dec. 16, 1981, Ser. No. 331,508

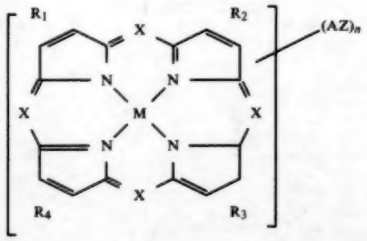
Claims priority, application United Kingdom, Dec. 22, 1980, 8040973

Int. Cl.³ C11D *3/39*; D06L *3/04*

U.S. Cl. 8—107 11 Claims



1. A bleach composition comprising a weakly colouring to non-colouring porphine photo-activator having the general formula:



wherein X is (=N—); wherein each of R_1, R_2, R_3 and R_4 is individually an optionally substituted ortho-arylene system forming together with a pyrrole ring in the porphine core a condensed nucleus; wherein M is 2(H) atoms bound diagonally opposite nitrogen atoms, or Zn (II), Ca (II), Mg (II), Al (III) or Sn (IV); wherein Z is any necessary counter ion for the solubilizing groups; wherein n is the number of solubilizing groups; wherein substituted into any R_1, R_2, R_3 and R_4 may be A, a solubilizing group selected from the group consisting of (a) cationic groups, where Z is an anion and n is from 0 to about 10; (b) polyethoxylate nonionic groups $-(CH_2CH_2O)_gH$, where Z is zero, n is from 0 to about 10, and G=ng=the number of condensed ethylene oxide molecules per porphine molecule is from 0 to about 70 and (c) anionic groups where Z is a cation and n is from 0 to about 10; such that the lowest energy allowed electronic transition of the photo-activator molecule gives rise to an absorption band (Q band) with a maximum intensity; at a wavelength greater than 700 nm.

4,400,174

PROCESS FOR PRINTING ON SYNTHETIC FIBERS: REDUCING AGENT AND ALKOXYLATED AMINE FOR DISCHARGE

Adolf Blum, and Norbert Grund, both of Ludwigshafen, Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Ludwigshafen, Fed. Rep. of Germany

Filed Apr. 1, 1982, Ser. No. 364,200

Claims priority, application Fed. Rep. of Germany, Apr. 4, 1981, 3113732

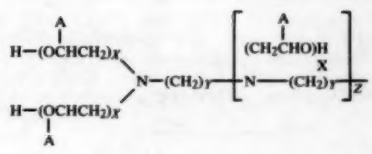
Int. Cl.³ D06P *3/26*

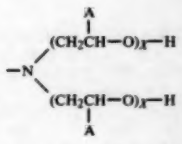
U.S. Cl. 8—456 9 Claims

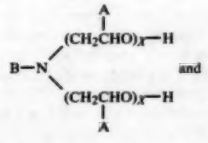
1. In the process for printing on synthetic fibers of polyester, triacetate, acetate and polyamide as well as mixtures thereof with disperse dyes according to the discharging or reserve discharging process the improvement wherein the discharging agent comprises a mixture of

(a) 5 to 75 parts by weight of at least one reducing agent selected from the group consisting of methane or ethane sulfinate group containing reducing agents, monosaccharides, reducing disaccharides, thiourea dioxide and mixtures thereof.

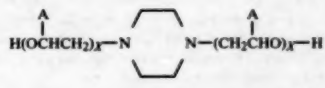
(b) 5 to 90 parts by weight of an alkoxylated amine selected from the group consisting of alkoxylated amines having the formulas


(I)

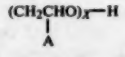



(II)

and


(III)

in which A represents hydrogen or methyl, B stands for C_1 to C_4 alkyl or a radical having the formula



wherein

X=1, 2, 3 or 4, Y=2, 3, 4, 5 or 6 and Z=0, 1, 2 or 3.

4,400,175
PROCESS AND AN APPARATUS FOR THE CRYSTALLIZATION OF MELTS WITH A SIMULTANEOUS CRUSHING OPERATION

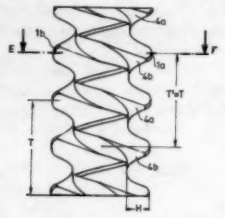
Claus Rathjen, and Martin Ullrich, both of Leverkusen, Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Filed Sep. 24, 1981, Ser. No. 305,567

Claims priority, application Fed. Rep. of Germany, Oct. 15, 1980, 3038973

Int. Cl.³ B01D *9/02*

U.S. Cl. 23—295 R **10 Claims**



1. In a process for the crystallization of melts of chemical products in a double-shaft, coolable worm machine with self-cleaning worm shafts rotating in the same direction, the improvement wherein: the crystalline material is continually crushed in a repeatedly cutting manner during solidification and during the subsequent cooling operation in the solid phase, while maintaining the main transporting direction in the worm by providing repeated interruptions over at least a part of the worm profile to form wedge shaped segment ridges.

4,400,176
PROCESS FOR REDUCING THE WATER CONTENT OF COAL CONTAINING BOUND WATER

Helmuth W. Kutta, Richardson, Tex., assignor to Atlantic Richfield Company, Los Angeles, Calif.

Filed Apr. 26, 1982, Ser. No. 371,624

Int. Cl.³ C10L *9/02*

U.S. Cl. 44—1 R **10 Claims**

1. In a process for reducing the water content of coal containing bound water by releasing at least a portion of said bound water, said process consisting essentially of, treating said coal by maintaining said coal at a temperature from about 220° to about 500° F. in the presence of water at a pressure sufficient to maintain at least a portion of said water in a liquid phase for a treatment time sufficient to release at least a portion of said bound water, an improvement comprising: contacting said coal with an acidic material selected from the group consisting of carboxylic organic acids containing up to about 6 carbon atoms, phenol, phenolic acids, and inorganic acids during at least a portion of sait treatment time.

4,400,177
FUELS AND METHODS FOR THEIR PRODUCTION

Eric C. Cottell, Windermere, Bayville, Long Island, N.Y. 11709

Continuation-in-part of Ser. No. 83,506, Sep. 24, 1979, abandoned. This application Jan. 25, 1982, Ser. No. 342,055

Int. Cl.³ C10L *1/32*

U.S. Cl. 44—51 **12 Claims**

1. A stable fuel emulsion comprising coal, distillate oil, greater than 3 weight percent water, and a stabilizing ingredient selected from the group consisting of No. 4 residual oil, No. 6 residual oil, other residual oils and combinations thereof.

4,400,178
LIQUID FUELS CONTAINING POLYAMINE DISPERSANTS

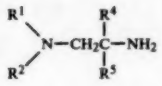
Donald I. Hoke, Chagrin Falls, Ohio, assignor to The Lubrizol Corporation, Wickliffe, Ohio

Continuation of Ser. No. 142,316, Apr. 21, 1980, abandoned. This application Sep. 14, 1981, Ser. No. 301,844

Int. Cl.³ C10L *1/22*

U.S. Cl. 44—72 **12 Claims**

1. A fuel composition comprising a major amount of a normally liquid fuel and a minor amount of at least one polyamine of the formula



wherein:

R^1 is an aliphatic hydrocarbon-based radical free from acetylenic unsaturation and containing 16–18 carbon atoms;

R^2 is hydrogen or an aliphatic hydrocarbon-based radical free from acetylenic unsaturation and containing 16–18 carbon atoms; and

each of R^4 and R^5 is a lower alkyl radical.

4,400,179
PARTIAL OXIDATION HIGH TURNDOWN APPARATUS

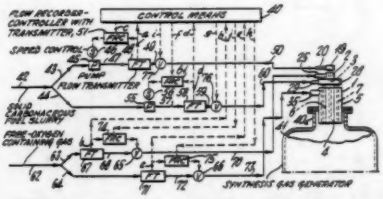
Charles P. Marion, Mamaroneck; Albert Brent, Huntington, both of N.Y.; George N. Richter, San Marino, Calif.; William B. Crouch, Chappaqua; Edward T. Child, Tarrytown, both of N.Y., and Blake Reynolds, Riverside, Conn., assignors to Texaco Inc., White Plains, N.Y.

Division of Ser. No. 167,876, Jul. 14, 1980, Pat. No. 4,351,645, which is a continuation-in-part of Ser. No. 107,215, Dec. 26, 1979, Pat. No. 4,338,099. This application Jun. 10, 1981, Ser. No. 272,417

The portion of the term of this patent subsequent to Sep. 28, 1999, has been disclaimed.

Int. Cl.³ C10J *3/50*

U.S. Cl. 48—86 R **4 Claims**



1. A control system for introducing first and second reactant feedstreams into the reaction zone of a partial oxidation gas generator compromising: a two-section burner mounted downward through an inlet port in the top of a vertical free-flow noncatalytic refractory lined synthesis gas generator and comprising central and annular sections which first and second fluid passage means in said central section and third and fourth fluid passage means in said annular section, a separate inlet means connected to each of said separate passage means, a separate feedline connected to each inlet means with feedlines 1 and 3 connected to the respective separate inlet means in said central section and feedlines 2 and 4 connected to the respective separate inlet means in said annular section, wherein one first reactant feedstream is passed through either the first or second fluid passage means in the central portion of the burner and/or simultaneously another first reactant feedstream is passed through the third or fourth fluid passage means in the

annular section, and a separate feedstream of the second reactant feedstream and if necessary a separate feedstream of steam are simultaneously passed through the unoccupied fluid passage means in the central and/or annular sections of said burner which are associated with fluid passage means through which the first reactant feed stream(s) are passing, said burner discharging into said reaction zone; and wherein the central section of said burner includes a central conduit, said central conduit being closed at the upstream end and having a unobstructed downstream circular exit orifice at the tip of the burner; said annular section being bounded by an outer conduit coaxial and concentric with said central conduit along its length and in spaced relationship therewith and forming an annular passage therebetween, said annular passage being closed at the upstream end and having an unobstructed downstream annular exit orifice at the tip of the burner and wherein the central longitudinal axis of the annular passage is parallel to the central longitudinal axis of the burner throughout its length; said first passage means comprises a central bunch of tubes passing through the closed end of said central conduit and making a gastight seal therewith, and wherein the downstream ends of said central bunch of tubes are retracted upstream from the burner face a distance of about 0 to 12 times the minimum diameter of the central conduit exit orifice at the tip of the burner; said second passage means comprising the space between the inside wall of said central conduit and the outside surfaces of the central bunch of tubes; said third passage means comprising an annular bunch of tubes passing through the closed end of said annular passage and making a gastight seal therewith, and wherein the downstream ends of said annular bunch of tubes are retracted upstream from the burner face a distance of about 0 to 12 times the minimum width of the annular exit orifice at the tip of the burner; and said fourth passage means comprising the space between the inside wall of the outer conduit and the outside surfaces of the annular bunch of tubes; a separate flow rate sensing means in each of said four feed lines for separately sensing the flow rates for that portion of the first reactant stream flowing through feedlines **1** and **2** and for that portion of the second reactant stream flowing through feedlines **3** and **4** and providing signals a, d and b, a corresponding respectively to the actual flow rates of the portions of said first and second reactant streams flowing in feedlines **1**, **2** and **3**, **4**; and a separate control means connected to each flow rate sensing means for comparing said actual flow-rate signals a, d, b and e with manual or automatically computed input signals representing the desired flow rate or set point for each of the reactant streams in the four feedlines, and providing a corresponding adjustment signal for separately operating a flow rate controller to control the flow rates of said first and second reactant streams in said four feedlines in accordance with the respective desired flow rate or set point of each.

4,400,180

PARTIAL OXIDATION PROCESS

Charles P. Marion, Mamaroneck; William B. Crouch, Chappaqua; Albert Brent, Huntington, all of N.Y.; George N. Richter, San Marino, Calif.; Edward T. Child, Tarrytown, N.Y., and Blake Reynolds, Riverside, Conn., assignors to Texaco, Inc., White Plains, N.Y.

Continuation-in-part of Ser. No. 212,054, Dec. 3, 1980, Pat. No. 4,371,378, which is a continuation-in-part of Ser. No. 167,876, Jul. 14, 1980, Pat. No. 4,351,645, which is a continuation-ia-part of Ser. No. 107,215, Dec. 26, 1979, Pat. No. 4,338,099. This application Jun. 10, 1981, Ser. No. 272,419

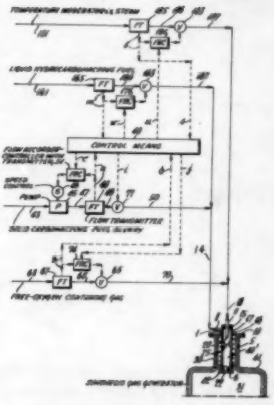
The portion of the term of this patent subsequent to Jul. 6, 1999, has been disclaimed.

Int. Cl.[3] **C10J** *3/46*

U.S. Cl. 48—197 R **12 Claims**

1. In a process for producing gaseous mixtures comprising H_2, CO, CO_2, entrained particulate carbon, and at least one material from the group consisting of H_2O, N_2, H_2S, COS, CH_4, Ar, and ash in a free-flow noncatalytic partial oxidation gas generator, the improvement employing a burner comprising a central conduit radially spaced from a concentric coaxial outer conduit and a free-flow coaxial annular passage therebetween, and changing from one reactant feedstream to another without shutting down or depressurizing the system comprising the steps of:

(1) passing a first reactant stream of liquid hydrocarbonaceous fuel with or without mixture with a temperature moderator through the annular passage of said burner; wherein said burner comprises said central conduit coaxial with the central longitudinal axis of said burner and having a downstream exit orifice that discharges into a pre-mix zone, said central conduit providing a passage, said outer coaxial conduit providing said annular passage along the length of said central conduit between the inside diameter of said outer conduit and the outside diameter of said central conduit, an exit nozzle coaxial with and terminating said outer conduit at the dowstream end of said burner, comprising a converging frusto-conical rear portion and a right cylindrical front portion, an annular shaped face-cooling chamber surrounding said exit nozzle at the burner tip, and wherein the tip of said central conduit is retracted upstream from the face of said burner a distance of two or more times the minimum diameter of said outer conduit converging exit nozzle to provide a pre-mix zone comprising one or more cylindrically shaped



communicating pre-mix chambers in tandem and coaxial with the central longitudinal axis of said burner;

(2) simultaneously passing a separate reactant stream of free-oxygen containing gas with or without mixture with a temperature moderator through the central conduit in said burner;

(3) mixing together said reactant streams from (1) and (2) in said pre-mix zone to produce a well-distributed mixture, and reacting said mixture by partial oxidation in the reaction zone of said gas generator at an autogenous temperature in the range of about 1700° to 3500° F., a pressure in the range of about 1 to 300 atmospheres, an atomic ratio of oxygen/carbon in the range of about 0.5 to 1.7, and a weight ratio H_2O/fuel in the range of about 0.1 to 3.0;

(4) phasing out of the fluid passage in which it is flowing in said burner said stream of liquid hydrocarbonaceous fuel with or without mixture with a temperature moderator, said phasing out being with a uniformly decreasing rate of flow that varies from maximum to 0 over a period of time in the range of about 1–3600 seconds; and simultaneously phasing a pumpable slurry stream of solid carbonaceous fuel in a liquid carrier in liquid phase and having a solids content in the range of about 30 to 75 wt. % in said burner at a-, uniformly increasing rate of flow that varies from 0 to maximum over the same period of time and mixing with

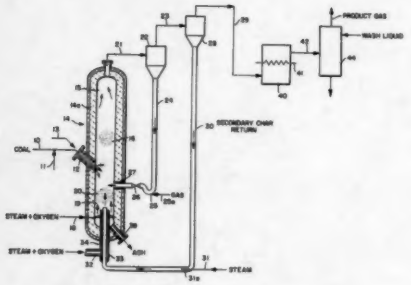
the remaining portion of and replacing the phased out portion of said stream of liquid hydrocarbonaceous fuel with or without mixture with a temperature moderator flowing therein; and

(5) adjusting up or down the flow rate of the reactant stream of free-oxygen containing gas with or without mixture with a temperature moderator passing through the burner and if necessary phasing in or out supplemental H_2O into the reaction zone, so as to adjust the free oxygen/carbon atomic ratio and the weight ratio H_2O/fuel in the reaction zone to design conditions for the partial oxidation reaction.

4,400,181
METHOD FOR USING FAST FLUIDIZED BED DRY BOTTOM COAL GASIFICATION

George J. Snell, Fords, and Paul H. Kydd, Lawrenceville, both of N.J., assignors to Hydrocarbon Research, Inc., Lawrenceville, N.J.

Filed Jan. 28, 1982, Ser. No. 343,626
Int. Cl.³ C10J 3/00
U.S. Cl. 48—197 R **11 Claims**



1. A process for gasifying particulate hydrocarbon feed materials to produce a fuel gas product, having low-to-medium heating value, comprising:

(a) introducing the hydrocarbon feed material with steam and oxygen into a gasification zone containing a fast fluidized bed of char particles for gasification therein, said zone being maintained at temperature of 1500°–1850° F., at pressure exceeding about 30 psig, and at upward superficial gas velocity exceeding about 5 ft/sec to heat and gasify the feed and produce a gaseous material;

(b) withdrawing said gaseous material along with char particles from the upper portion of the gasification zone and passing the materials to a primary gas-solids separation step for char solids removal;

(c) withdrawing a first gas stream from said primary gas-solids separation step and returning particulate char solids to the gasification zone;

(d) passing said first gas stream to a secondary gas-solids separation step and removing fine char solids therefrom;

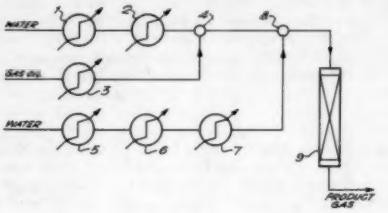
(e) returning the fine particulate char solids from the secondary gas-solids separation step to the lower end of a fluidized bed oxidation zone located immediately below the fast fluidized bed gasification zone; said oxidation zone having temperature maintained within the range of 1600°–2000° F.; and

(f) withdrawing a fuel gas product stream from the secondary gas-solids separation step.

4,400,182
VAPORIZATION AND GASIFICATION OF HYDROCARBON FEEDSTOCKS

Haydn S. Davies; James H. Garstang, and Cyril Timmins, all of Solihull, England, assignors to British Gas Corporation, London, England

Continuation of Ser. No. 241,617, Mar. 9, 1981, abandoned. This application Jul. 19, 1982, Ser. No. 399,230
Claims priority, application United Kingdom, Mar. 18, 1980, 8009130
Int. Cl.³ C07C 9/02
U.S. Cl. 48—214 A **2 Claims**



1. A process for the production of methane-containing gases by the catalytic steam reforming of normally liquid vaporizable hydrocarbon materials at least as heavy as kerosene which process includes the steps of:

(a) vaporising and heating said hydrocarbon to a temperature above which significant pyrolysis would be expected to occur by introducing said material into a stream of steam to form a first mixture having a temperature greater than the dew point of the hydrocarbon but below said pyrolysis temperature,

(b) injecting a further amount of steam, at a temperature greater than the stream of steam used in step (a) and greater than said pyrolysis temperature, into said first mixture to form a second mixture whose temperature is greater than said pyrolysis temperature, said injection of said further amount of steam occurring prior to any reaction of said first mixture,

(c) thereafter, and prior to any significant pyrolysis of said second mixture, passing said second mixture through a bed of a coprecipitated nickel-alumina catalyst to effect a steam reforming reaction on said hydrocarbon.

4,400,183
PROCESSES FOR SEPARATING THE NOBLE FISSION GASES XENON AND KRYPTON FROM WASTE GASES FROM NUCLEAR PLANTS

Edmund Henrich, Liedolsheim; Reinhold Hüfner, and Friedhelm Weirich, both of Karlsdorf-Neuthard, all of Fed. Rep. of Germany, assignors to Kernforschungszentrum Karlsruhe GmbH, Karlsruhe, Fed. Rep. of Germany

Filed Oct. 21, 1981, Ser. No. 313,662
Claims priority, application Fed. Rep. of Germany, Oct. 21, 1980, 3039604
Int. Cl.³ B01D 53/16
U.S. Cl. 55—44 **13 Claims**

1. In a process for separating the noble fission gases xenon and krypton from a prepurified waste gas from a nuclear plant, the prepurified waste gas being substantially free of the main contaminating components, namely, aerosols, No_x, CO_2, water vapor, iodine and RuO_4 and consisting essentially of Xe, Kr, N_2O, O_2, N_2 and small quantities of CO_2, wherein:

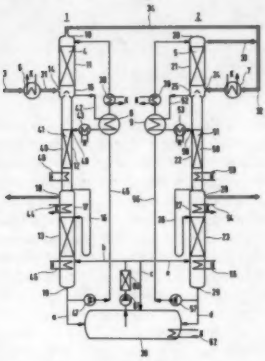
(a) the prepurified waste gas is brought into contact with liquid Cl_2CF_2 as an absorption agent, whereby Xe, Kr, N_2O and CO_2 are absorbed by the agent and small quantities of O_2 and N_2 are absorbed and thus removed from the waste gas;

(b) subsequently the liquid absorption agent containing the

absorbed gases is heated to substantially the boiling temperature of Cl_2CF_2 for vaporizing part of the liquid absorption agent and desorbing an absorbed noble fission gas, the desorbed noble fission gas being carried along by the vaporized absorption agent;

(c) the noble fission gas which is carried along by the vaporized absorption agent is separated from the vaporized absorption agent by condensation of said vapor; and

(d) the Cl_2CF_2, which has been freed in step (c) from the absorbed noble fission gas and condensed, is circulated and reused; the improvement comprising:



in step (a), absorbing Xe and Kr in liquid Cl_2CF_2 at an operating pressure equal to or less than normal pressure;

in step (b), separating the Xe and Kr from one another at a temperature which corresponds substantially to the boiling point of Cl_2CF_2 at said operating pressure, with the Kr being desorbed and carried along by the vaporized absorption agent;

in step (c), recovering the separated Kr; and

desorbing and recovering the separated Xe.

4,400,184

SYSTEM FOR RECOVERING PRESSURE AND SENSIBLE HEAT FROM BLAST FURNACE GAS WITH USE OF DRY-TYPE DUST COLLECTOR

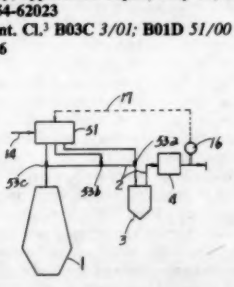
Yukio Tomita, Osaka; Takayuki Wakabayashi, Takatsuki; Noriyuki Oda, Sennan, and Hirotaka Yamamoto, Takatsuki, all of Japan, assignors to Hitachi Shipbuilding and Engineering Company Limited, Osaka, Japan

Continuation of Ser. No. 147,200, May 6, 1980, abandoned. This application Feb. 5, 1982, Ser. No. 346,190

Claims priority, application Japan, May 18, 1979, 54-62021; May 18, 1979, 54-62023

Int. Cl.³ B03C *3/01*; B01D *51/00*

U.S. Cl. 55—106 **9 Claims**



1. In a system for recovering as power, pressure and sensible heat from a gas discharged from the top of a blast furnace, including a gas channel which conducts the gas from the blast furnace to a dust collector means for the removal of dust while maintaining the gas at furnace top pressure and which feeds the gas from the dust collector means into a turbine for expansion, the improvement wherein:

said dust collector means comprises a dry-type bag filter or electric precipitator installed in said gas channel for cleaning the gas without substantial cooling of the gas from a normal high temperature of 130° to 150° C.;

supply means for supplying a cooling fluid to said gas channel between the blast furnace and said dust collector means, said supply means including pipes connecting said supply means with first, second and subsequent injectors arranged along and exposed to the interior of said gas channel at suitable spacing, each injector being provided with an electrically operable valve, the valves differing from one another in the maximum rate of flow therethrough with the valve of smaller maximum flow rate being provided on said first injector, and said first injector being positioned closer to the downstream side with respect to the flow of the gas;

sensor means for detecting the temperature of the gas is disposed in the gas channel close to the gas outlet of said dust collector means; and

control means connected to said sensor means and to said injector valves for opening at least one of said injector valves in response to the gas temperature detected by said sensor means exceeding a specified value set above said normal high temperature and below the maximum temperature said dust collector means can endure, the control means being adapted to feed opening signals to the injector valves starting with the valve provided on the first injector on the downstream side and from valve to valve toward the upstream side, and the control means being adapted to calculate a desired degree of opening of the first injector valve from the magnitude of a signal representing the difference between the detected temperature signal from said sensor means and the set temperature signal and feed the resulting signal to the first injector valve, to further calculate a desired degree of opening of the second injector valve and feed the resulting signal to the second injector valve when the difference signal can result even when the first injector valve is fully opened, and to further calculate a desired degree of opening of each subsequent injector valve in succession and feed the resulting signal to the corresponding injector valve when the difference signal can result even when each preceding injector valve is fully opened.

4,400,185

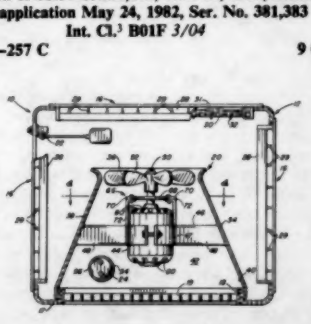
EVAPORATIVE COOLER WITH IMPROVED AIR HANDLING MECHANISM

Adam D. Goettl, 4960 E. Palomino Rd., Phoenix, Ariz. 85018

Continuation of Ser. No. 211,132, Nov. 28, 1980, abandoned. This application May 24, 1982, Ser. No. 381,383

Int. Cl.³ B01F *3/04*

U.S. Cl. 55—257 C **9 Claims**



1. A fan-type evaporative cooler comprising:

(a) an evaporative cooler including a cabinet having an air delivery outlet opening;

(b) a fan shroud having an endless sidewall which defines an air movement path between an air inlet of circular configuration formed in one end thereof and an axially aligned air outlet formed in the other end, said fan shroud divergingly extending from the air inlet to the air outlet to define an area of minimum cross section, said fan shroud being mounted entirely within the cabinet of said evaporative cooler so that the air outlet is in communication with the air delivery outlet opening of the cabinet and the air inlet remote therefrom;

(c) an electric motor mounted within said fan shroud so as to lie on the axis of the air movement path defined by said fan shroud, said electric motor having an output shaft which extends axially from said motor toward the air inlet of said fan shroud; and

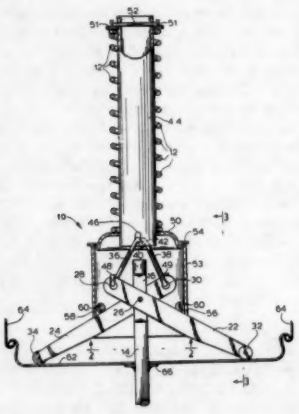
(d) a multi-blade fan mounted on the output shaft of said electric motor concentrically in an area of minimal cross section of said fan shroud.

4,400,186

CONSTANT TENSION DEVICE FOR FILTER BAG

Carl V. Leunig, Glenmont, N.Y., and Stewart W. Smith, Springfield, Mass., assignors to Albany International Corporation, Menands, N.Y.

Filed Sep. 17, 1981, Ser. No. 303,148
Int. Cl.³ B01D *46/02*
U.S. Cl. 55—379 **18 Claims**



1. In a filtering assembly comprising a filter bag, a bag cap secured to said filter bag, and an opening within said bag cap, the improvement comprising:

spring means within said filter bag;

pressure transmitting means connected to said spring means and contacting said bag cap for applying pressure to said bag cap as a function of a spring force exerted by said spring means, said pressure transmitting means including means for varying the mechanical advantage through which the spring force is exerted upon said bag cap by said pressure transmitting means such that when said spring force is relatively high, the mechanical advantage is relatively high, and when said spring force is relatively low, the mechanical advantage is relatively low, thereby resulting in a substantially constant pressure being applied by said pressure transmitting means to said bag cap even if the spring force exerted by said spring means changes; and

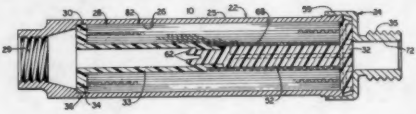
means for adjusting the spring force exerted by said spring means, said adjusting means extending through said opening within said bag cap.

4,400,187

DEVICE FOR PREVENTING CIRCULATION OF LIQUID WATER ENTRAINED IN COMPRESSED AIR

Arlo E. Lane, Reading, Mich., assignor to Roy E. Coffman, Tekonsha, Mich., a part interest

Continuation of Ser. No. 134,876, Mar. 28, 1980, abandoned. This application Jan. 12, 1982, Ser. No. 338,913
Int. Cl.³ B01D *53/04*
U.S. Cl. 55—387 **9 Claims**



1. In combination with a compressed air line, a tubular container in series with the compressed air line which comprises a hollow cylindrical body having an entry end and an exit end, a hollow cylindrical screen member mounted inside the body, means supporting the hollow cylindrical screen member in communication with the entry end of the cylindrical body, there being an annular space inside the body surrounding the hollow cylindrical screen member, a plug of porous water absorbent material surrounding and in communication with the hollow cylindrical screen member and inside the body and filling the space between the hollow cylindrical screen member and the body, and means directing air from the plug into the exit end of the cylindrical body, the plug of porous material absorbing droplets of water in the stream of compressed air passing through the tubular container and providing a surface from which the water evaporates as the compressed air passes through the plug, the means supporting the hollow cylindrical screen member including a spool shaped plug support assembly including a central stem portion extending lengthwise of and inside the hollow cylindrical screen member, there being an opening between the central stem portion and the hollow cylindrical screen member and heads transversely spanning the inside of the body at opposite ends of the stem portion, the head adjacent the entry end closing and sealed to the entry end portion of the body, the plug extending between the heads, there being opening means in one of the heads to direct air entering the body into the opening in the interior of the screen between the central stem portion and the hollow cylindrical screen member and window means in the other head directing air from the plug of porous material to be discharged from the body.

2. In combination with a compressed air line, a tubular container comprising a tubular container body and a tubular container end closure member connecting inlet and exit portions of the compressed air line, the body having an entry end and an exit end, a hollow cylindrical screen member mounted inside the body, means supporting the hollow cylindrical screen member in communication with an entry end of the cylindrical body, the means supporting the hollow cylindrical screen member including a spool shaped plug support assembly including a central stem portion extending lengthwise of and inside the hollow cylindrical screen member, there being an opening between the central stem portion and the hollow cylindrical screen member extending from the entry end of the hollow cylindrical screen member toward the opposite end thereof and heads at opposite ends of the stem portion closing and sealed to portions of the body respectively adjacent the entry and exit ends thereof, there being space inside the body between the hollow cylindrical screen member, the spool shaped plug support assembly and the body, a plug of porous water absorbent material surrounding and in communication with the hollow cylindrical screen member and inside the body and filling the space between the hollow cylindrical screen member, the spool shaped plug support assembly and the body, there being opening means in one of the heads to direct air entering the body into an opening in the interior of the hollow

cylindrical screen member, window means in the other head directing air from the plug of porous material to be discharged from the body, one of the head members being slideably received inside the body for sealing engagement therewith, the periphery of the other of the head members being in sealed relation to the tubular container, the plug of porous material absorbing droplets of water in the stream of compressed air passing through it from the hollow cylindrical screen member to the window means and providing a surface from which the water evaporates as the compressed air passes through the plug.

4,400,188

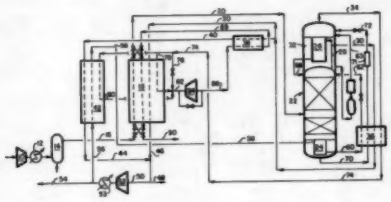
NITROGEN GENERATOR CYCLE

Suresh U. Patel, Whitehall; Thomas E. Cormier, Schnecksville, and Keith B. Wilson, Allentown, all of Pa., assignors to Air Products and Chemicals, Inc., Allentown, Pa.

Filed Oct. 27, 1981, Ser. No. 315,683

Int. Cl.³ F25J 3/02

U.S. Cl. 62—13 **4 Claims**



1. A process for the separation of large tonnages of essentially pure nitrogen gas from air comprising the steps of:

(a) compressing and after cooling a feed air stream;

(b) removing the moisture and carbon dioxide from said compressed air stream;

(c) cooling said air stream in a heat exchanger against crude oxygen and product nitrogen streams;

(d) introducing the cooled and compressed air stream into a single distillation column;

(e) separating an essentially pure nitrogen overhead stream and a crude, impure oxygen bottom stream from said column;

(f) splitting the nitrogen overhead stream into a stream which is condensed against boiling crude oxygen and returned as reflux to the head of the distillation column, and a gaseous nitrogen stream which is removed from the column;

(g) warning said gaseous nitrogen stream against the incoming feed air stream and a recycle nitrogen stream in said heat exchanger;

(h) compressing and aftercooling the gaseous nitrogen stream and splitting the compressed stream into a gaseous nitrogen product and a recycle nitrogen stream which is cooled in said heat exchanger;

(i) reboiling the bottom of said column by heat exchange with said recycle nitrogen stream while cooling and condensing said stream;

(j) introducing the recycle nitrogen stream into the head of the distillation column as reflux by cooling the stream against the nitrogen product stream and a crude oxygen overhead stream and then expanding the cooled recycle nitrogen stream;

(k) removing a crude liquid oxygen stream from the bottom of said column and cooling said stream against the essentially pure nitrogen product stream and a vaporized crude oxygen stream before expanding and introducing the same into the low pressure side of the condenser at the head of said column;

(l) removing said vaporized crude oxygen stream from the condenser overhead of said column and warming it against the nitrogen recycle stream and the feed air stream before expanding the crude oxygen through an expander to produce refrigeration for the process.

4,400,189

PULSED CRYSTALLIZATION COLUMN AND METHOD OF COUNTERCURRENT CRYSTALLIZATION

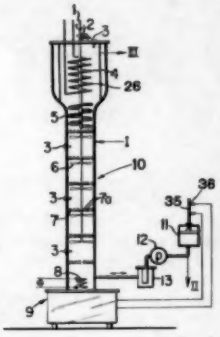
Gerardus J. Arkenbout; Albert van Kuijk, both of Zeist; Johannes van der Meer, Loenen a/d Vecht, and Leonardus H. J. M. Schneiders, Zeist, all of Netherlands, assignors to Nederlandse Centrale Organisatie voor Toegepast Natuurwetenschapplijk Onder Zoek, The Hague, Netherlands

Continuation-in-part of Ser. No. 158,733, Jun. 12, 1980, abandoned. This application Feb. 16, 1982, Ser. No. 348,981

Claims priority, application Netherlands, Feb. 13, 1980, 8000906

Int. Cl.³ B01D 9/02

U.S. Cl. 62—538 **11 Claims**

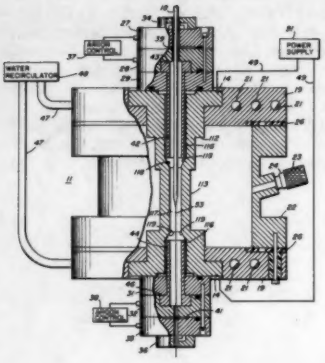


8. In the process for continuous countercurrent liquid-solids contact for multistage crystallization by adiabatic recrystallization and extractive washing comprising the steps of passing a liquid in essentially one direction through a vertically-aligned confined space in contact with crystals being passed in the other direction, said liquid being a solvent for at least part of said crystals, said confined space being substantially horizontally restricted in a plurality of places, said horizontal restrictions being a plurality of perforated plates positioned at spaced intervals in said vertically aligned confined space-forming compartments, said restrictions being such that the said crystalline solids to be treated in countercurrent with said liquid substantially pass through said perforated plates, providing a drumming action against said perforated plates by means of movable substantially spherical objects being substantially vertically vibrated against said perforated plates at a frequency of between 100 and 10,000 vibrations per minute with amplitudes of between 0.1 and 5 millimeters, whereby the passage of said crystalline solids through the perforations of said perforated plates is substantially promoted, said substantially vertical vibrations of said movable objects being effected by motion of said perforated plates in a vertical oscillation at such a rate that said movable objects are subjected to accelerating forces of about 2 to 5 times the gravitational forces, the improvement consisting of moving said liquid slowly and periodically with respect to said perforated plates, where said liquid movement and said drumming action are coordinated whereby said drumming action occurs only when said liquid is moving through said perforated plates in the direction said crystalline solid is being passed.

4,400,190
GRAPHITE ELEMENT FOR USE IN A FURNACE FOR DRAWING OPTICAL FIBER

Alfred D. Briere, Worcester, Mass., assignor to GTE Laboratories Incorporated, Waltham, Mass.

Filed Sep. 28, 1981, Ser. No. 306,066
Int. Cl.³ C03B 37/07, 37/09
U.S. Cl. 65—13 9 Claims



1. A furnace for drawing optical fiber, including a graphite heating element of generally cylindrical shape with a reduced central cross-sectional configuration having a flange at opposite ends thereof and having an axial hole therethrough including a central internal element chamber for receiving a glass preform,

means for heating said reduced central cross-sectional configuration and, hence, said central internal element chamber so that an optical fiber can be drawn from said preform,

means for supporting said graphite element at said flanges;

an input exhaust tube having a principal central portion adapted to reside within said axial hole at the top of said graphite heating element, having an inner diameter large enough to permit said glass preform to fit therewithin and to permit an inert gas to pass exterior to said preform and interior to said tube, and having a flange;

means for supporting said input exhaust tube;

an exit exhaust tube having a principal central portion adapted to reside within said axial hole at the bottom of said graphite heating element, having an inner diameter large enough to permit an optical fiber to pass therethrough and to permit an inert gas to pass exterior to said optical fiber and interior to said exit exhaust tube, and having a flange;

means for supporting said exit exhaust tube; and

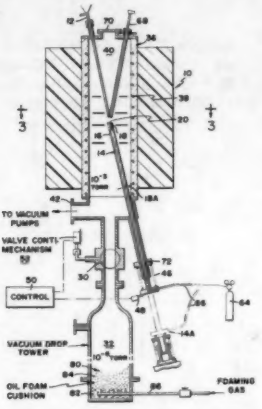
means for applying an inert gas to the top of said heating element so that inert gas passes down through the interior of said input exhaust tube and up and out around the outside of said input tube within said axial hole, and means for applying an inert gas to the bottom of said heating element so that inert gas passes up through the interior of said exit exhaust tube and is permitted to pass down and out around the outside of said exit exhaust tube within said axial hole;

wherein the improvement comprises an internal diameter of said central internal element chamber and said inner diameter of said input exhaust tube have a relationship so as to minimize gas turbulence within said central internal element chamber.

4,400,191
SPHERE FORMING METHOD AND APPARATUS

Charles L. Youngberg, Altadena, Calif.; Charles G. Miller, deceased, late of Pasadena, Calif.; James B. Stephens, La Crescenta, and Anthony A. Finnerty, La Canada, both of Calif., assignors to The United States of America as represented by the Administrator of the National Aeronautics and Space Administration, Washington, D.C.

Filed Jul. 30, 1982, Ser. No. 403,847
Int. Cl.³ C03B 19/10
U.S. Cl. 65—21.4 21 Claims



1. A method for forming a rounded object, comprising:

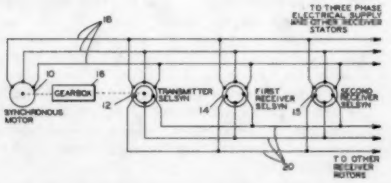
supporting the object in a largely molten state at an opening in a conduit, including flowing gas in a largely upward vertical direction out of said conduit opening to support the object on the gas flow; and

rapidly sidewardly displacing said conduit relative to said object, to allow said object to fall in a vacuum chamber to solidify the object during freefall.

4,400,192
APPARATUS AND METHOD FOR GENERATING CLOCK PULSES FROM A POWER SELSYN MULTIPLE MOTOR DRIVE SYSTEM FOR A GLASSWARE FORMING MACHINE

Daniel S. Farkas, Toledo, Ohio, assignor to Owens-Illinois, Inc., Toledo, Ohio

Filed Dec. 10, 1981, Ser. No. 329,363
Int. Cl.³ C03B 9/40
U.S. Cl. 65—29 19 Claims



1. In a glassware forming machine including a plurality of driven mechanisms and a power selsyn multiple motor drive means for driving the mechanisms, the selsyns having interconnected stator windings connected to a source of electrical power and having interconnected rotor windings for synchronously driving the driven mechanisms with the rotors, an apparatus for generating a speed signal having a frequency

directly proportional to the speed of the selsyn rotors comprising:

means responsive to the frequency of the power signal in the rotor windings for generating a first output signal having a frequency proportional to the rotor power frequency;

means responsive to the frequency of the power signal in the stator windings for generating a second output signal having a frequency proportional to the stator power frequency; and

means responsive to said first and second output signals for generating the speed signal as a difference frequency signal having a frequency which is equal to the difference between the stator and rotor power frequencies.

18. A method of generating a speed signal for a glassware forming machine including a plurality of driven mechanisms and a power selsyn multiple motor drive means, the selsyns having interconnected stator windings connected to a source of electrical power and having interconnected rotor windings for synchronously driving the driven mechanisms, the method of generating the speed signal having a frequency directly proportional to the speed of the selsyns comprising the steps of:

(a) generating a first signal representing the frequency of the power signal present in the rotor windings;

(b) generating a second signal representing the frequency of the power signal present in the stator windings; and

(c) subtracting said first signal from said second signal to generate the speed signal as a difference frequency signal having a frequency which is equal to the difference between the stator and rotor power frequencies.

4,400,193

METHOD OF THERMAL TOUGHENING OF GLASS IN A FLUIDIZED BED

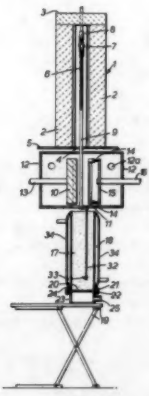
Raymond P. Cross, Preston, and Gordon T. Simpkin, Ormskirk, both of United Kingdom, assignors to Pilkington Brothers Limited, United Kingdom

Continuation of Ser. No. 934,728, Aug. 21, 1978, abandoned. This application Oct. 19, 1979, Ser. No. 86,322

Claims priority, application United Kingdom, Aug. 17, 1978, 33759/78

Int. Cl.³ C03B *27/00*

U.S. Cl. 65—114 **5 Claims**



1. A method of thermally toughening glass comprising heating the glass to a temperature above its strain point and chilling the hot glass with a gas-fluidised particulate material in a quiescent uniformly expanded state of particulate fluidisation, wherein the particulate material is aluminium trihydrate ($Al_2O_3.3H_2O$) having a mean particle size in the range 62 to 86 μm, a particle size distribution in the range 1.64 to 2.73, a flowability point score in the range 69.5 to 82, and a thermal capacity per unit volume at minimum fluidisation in the range 1.52 to 1.59 MJ/m^3K.

4,400,194

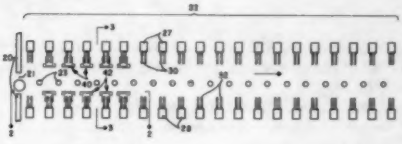
METHOD AND APPARATUS FOR PRODUCING HEAT-STRENGTHENED GLASS SHEETS HAVING IMPROVED BREAK PATTERNS

Eugene W. Starr, Allison Park, Pa., assignor to PPG Industries, Inc., Pittsburgh, Pa.

Filed Feb. 10, 1982, Ser. No. 347,668

Int. Cl.³ C03B *27/04*

U.S. Cl. 65—114 **20 Claims**



1. A method of fabricating a heat-strengthened glass sheet having a break pattern on fracture that permits the fractured glass sheet to be retained within an installation frame comprising heating said glass sheet to a temperature sufficient for tempering by moving said glass sheet through a heating area, force cooling the lateral side portions of said moving glass sheet while cooling the area of said moving glass sheet intermediate said lateral side portions at a lesser rate of cooling to establish a temperature gradient in the sheet transverse to its direction of movement comprising relatively cold lateral side portions and a relatively hot intermediate area, and, before the temperature of the intermediate area of said moving glass sheet reaches the strain point, applying streams of cold quenching medium to the entire major surfaces of said moving glass sheet at a flow rate sufficient to provide said heat-strengthened glass sheet with said desired break pattern.

7. Apparatus for heat strengthening glass sheets comprising:

a furnace;

a quenching station mounted adjacent an exit end of the furnace wherein said quenching station includes:

first means mounted on each side of the path of travel for directing tempering medium toward the path of travel;

baffle means mounted between said first directing means and adjacent side of the path of travel, said baffle means including a plate comprising:

an imperforate portion facing only a center portion of the path of travel to restrict flow of tempering medium toward the center portion of the path, and

an apertured portion having apertures beyond each transverse end of said imperforate portion facing lateral side portions of the path of travel to permit flow of quenching medium through said apertures toward the lateral side portions only of the path of travel to establish a temperature gradient in the sheet moving between said first directing means transverse to the path of travel;

second means mounted on each side of the path of travel downstream of said first directing means for directing quenching medium toward the path of travel between said second directing means to provide heat strengthened glass with a predetermined break pattern; and

means for moving a glass sheet along a path of travel through the furnace and said quenching station.

4,400,195
METHOD FOR THE ANAEROBIC DIGESTION OF SOLID ORGANIC WASTE

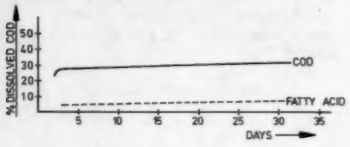
Berend A. Rijkens, Zeist, Netherlands, assignor to Instituut voor Bewaring en Verwerking van Landbouwprodukten, Wageningen, Netherlands

Continuation of Ser. No. 213,667, Dec. 5, 1980, abandoned. This application Feb. 8, 1982, Ser. No. 347,073

Claims priority, application Netherlands, Apr. 3, 1980, 8001997; Dec. 2, 1980, 8006567

Int. Cl.³ C05F *11/08*

U.S. Cl. 71—10 **6 Claims**



1. A method for the anaerobic digestion of solid organic material originating from plants or animals or both comprising the steps of:

(a) simultaneously composting the solid organic waste under anaerobic conditions in a primary reaction space provided with a strainer while;

(b) rinsing the solid organic waste from step (a) with an aqueous liquid to substantially dissolve and remove soluble organic and inorganic substances and the water soluble fatty acids formed by the decomposition;

(c) feeding the aqueous liquid obtained in step (b) substantially free from undissolved solid organic waste from the primary reaction space into an auxiliary reactor;

(d) leaving the remaining compost behind in the primary reaction space;

(e) under anaerobic conditions in the auxiliary reactor, converting the dissolved organic material in the aqueous solution into a mixture of carbon dioxide and methane gas; and

(f) removing the remaining compost from the primary reaction space.

4,400,196
HERBICIDAL COMPOSITIONS

Konrad Albrecht, Kelkheim, and Peter Langelüddeke, Hofheim am Taunus, both of Fed. Rep. of Germany, assignors to Hoechst Aktiengesellschaft, Frankfurt am Main, Fed. Rep. of Germany

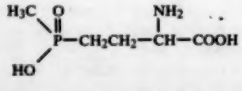
Filed Sep. 18, 1981, Ser. No. 303,373

Claims priority, application Fed. Rep. of Germany, Sep. 20, 1980, 3035554

Int. Cl.³ A01N *57/00*

U.S. Cl. 71—86 **9 Claims**

1. An herbicidal composition consisting essentially of an herbicidally effective amount of an active ingredient of the formula



or lower alkyl esters or salts with acids or bases thereof, in combination with an effective amount of coconut fatty alkylbenzyldimethyl-ammonium chloride or an alkali metal salt or ammonium salt of an alcohol polyglycol ether sulfate having 12 to 16 carbon atoms as surfactant.

4,400,197
N-(OPTIONALLY SUBSTITUTED 1,3-DIOXOLAN- OR DIOXAN-2-YLMETHYL)-N-ALKYL, ALKENYL, OR ALKYNYL-2,2-DICHLOROACETAMIDES

Jay K. Rinehart, Akron, Ohio, assignor to PPG Industries, Inc., Pittsburgh, Pa.

Division of Ser. No. 106,434, Dec. 26, 1979, Pat. No. 4,294,764. This application Jun. 22, 1981, Ser. No. 276,309

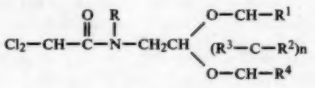
Int. Cl.³ A01N *25/32*

U.S. Cl. 71—88 **10 Claims**

1. A composition containing:

(a) a herbicidally effective amount of N-dialkyl thiocarbamate; and

(b) an antidotally effective amount of a compound represented by the formula:



wherein:

R is ethyl, propyl, 1-methylethyl, 2-propenyl, butenyl, 2-methyl-2-propenyl, 2-propynyl or 1,1-dimethyl-2-propynyl;

R^1, R^2, R^3 and R^4 are independently hydrogen or methyl; and

n is 0 or 1.

4,400,198
HERBICIDAL TETRAHYDROFURAN DERIVATIVES

Alexander F. Orr, and Michael D. Barker, both of Sittingbourne, England, assignors to Shell Oil Company, Houston, Tex.

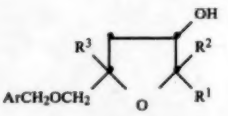
Continuation-in-part of Ser. No. 225,950, Jan. 19, 1981, abandoned. This application Jul. 16, 1981, Ser. No. 283,704

Claims priority, application United Kingdom, Jan. 21, 1980, 8001921; Canada, Dec. 31, 1980, 367728; United Kingdom, Jan. 19, 1981, 8101556

Int. Cl.³ C07D *307/12, 405/12;* A01N *43/08, 43/40*

U.S. Cl. 71—88 **10 Claims**

1. A tetrahydrofuran derivative of the formula



wherein R^1 and R^2 independently represent a hydrogen atom, a methyl group or an ethyl group, or R^1 and R^2 together represent a pentamethylene group; R^3 represents a methyl, halomethyl, ethyl or methoxymethyl group, and Ar represents phenyl, 2-fluorophenyl, 2-chlorophenyl, 2,6-dichlorophenyl or 2-pyridyl.

9. A method of combating undesired plant growth at a locus, which comprises treating the locus with a herbicidally effective amount of a compound according to claim **1**, or a composition thereof.

4,400,199
THIOLCARBAMATE COMPOUNDS AND THEIR USE AS HERBICIDES

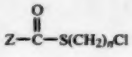
Shigeo Yokoyama; Teruyuki Misumi; Einosuke Fujimoto, and Yutaka Kobayashi, all of Yokohama, Japan, assignors to Asahi Kasei Kabushiki Kaisha, Tokyo, Japan

Filed Oct. 29, 1981, Ser. No. 316,305

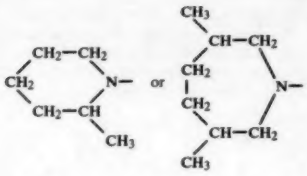
Int. Cl.³ A01N *47/16;* C07D *211/16*

U.S. Cl. 71—88 **10 Claims**

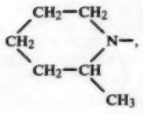
1. A compound represented by the formula



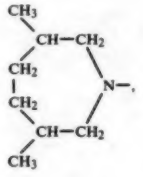
wherein Z represents



and when Z is

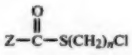


n is an integer of 4 to 10, whereas when Z is

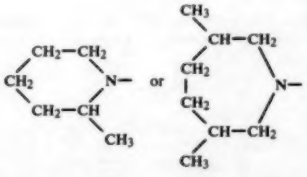


n is an integer of 3 to 10.

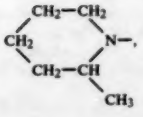
8. A method for the destruction of undesirable weeds which comprises applying to said weeds a herbicidal amount of a compound represented by the formula



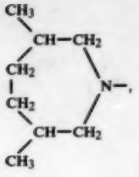
wherein Z represents



and when Z is



n is an integer of 4 to 10, whereas when Z is



n is an integer of 3 to 10.

4,400,200

HALOACYL AND THIOHALOACYL ARYL-SUBSTITUTED OXAZOLIDINES AND THIAZOLIDINES - HERBICIDAL ANTIDOTES

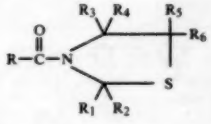
Eugene G. Teach, El Cerrito, Calif., assignor to Stauffer Chemical Company, Westport, Conn.

Division of Ser. No. 840,873, Oct. 11, 1977, Pat. No. 4,322,240, which is a continuation-in-part of Ser. No. 550,069, Feb. 14, 1975, abandoned. This application Nov. 4, 1981, Ser. No. 317,957

Int. Cl.³ A01N *43/00*

U.S. Cl. 71—88 **41 Claims**

1. An herbicidal composition comprising an active thiolcarbamate herbicidal compound and a non-phytotoxic antidotally effective amount of antidote therefor corresponding to the formula



wherein R is haloalkyl having 1 to 6 carbon atoms, inclusive, halo is chloro or bromo or chloroalkenyl; R_1 is hydrogen, lower alkyl having 1 to 4 carbon atoms, inclusive, phenyl, naphthyl, substituted phenyl wherein said substituents are mono-fluoro, mono- or di-chloro, nitro, methyl, methoxy, or hydroxyl; R_2 is hydrogen or lower alkyl having 1 to 4 carbon atoms, inclusive; R_3 is hydrogen, hydroxymethyl, N-methylcarbamoyloxymethyl or dichloroacetoxymethyl; R_4 is hydrogen, or lower alkyl having 1 to 4 carbon atoms, inclusive; R_5 is hydrogen, lower alkyl having 1 to 4 carbon atoms, inclusive or phenyl; and R_6 is hydrogen; provided that at least one of R_1 or R_5 is phenyl, substituted phenyl or naphthyl; said compound being antidotally active with said thiolcarbamate herbicide compound and wherein said compound is present in an amount between about 0.0001 to about 30 parts by weight of antidote compound per each part by weight of herbicide.

4,400,201

NOVEL PYRIMIDINYL ETHERS, THEIR USE AS HERBICIDES, HERBICIDAL COMPOSITIONS COMPRISING SAID PYRIMIDINYL ETHERS AND PROCESSES FOR THE PREPARATION THEREOF

Karlheinz Milzner, Basel, Switzerland, assignor to Sandoz Ltd., Basel, Switzerland

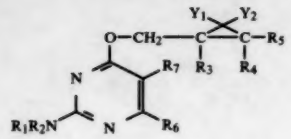
Filed Dec. 10, 1981, Ser. No. 329,260

Claims priority, application United Kingdom, Dec. 15, 1980, 8040074

Int. Cl.³ A01N *9/22*; **C07D** *239/47*

U.S. Cl. 71—92 **7 Claims**

1. A compound of formula I,



I

wherein

either R_1 is H or (C_{1-18})alkyl, (C_{1-18})alkyl substituted by up to 2 substituents selected from (C_{1-4})alkoxy or 2-tetrahydrofuryl; (C_{1-18})alkenyl; (C_{3-8})-cycloalkyl or (C_{3-8})cycloalkyl-(C_{1-5})alkyl, unsubstituted or substituted by up to 2 halogens selected from fluorine, chlorine and bromine; phenyl unsubstituted or substituted by up to 3 substituents selected from halogen of the group fluorine, chlorine and bromine (C_1-C_4)alkyl and (C_1-C_4)alkoxy;

and R_2 is H, (C_1-C_5)alkyl,

or R_1 and R_2 together are a (C_4-C_6)alkylene chain,

Y_1 and Y_2 independently are H or halogen selected from fluorine, chlorine or bromine,

R_3, R_4 and R_5 independently are H, (C_1-C_5)alkyl unsubstituted or substituted by halogen selected from fluorine, chlorine or bromine,

R_6 is (C_1-C_5)alkyl, and

R_7 is H or (C_1-C_5)alkyl in free base or acid addition salt form.

4,400,202

N-M-PHENYL GLUTARIMIDE DERIVATIVES AND THEIR USE AS HERBICIDES

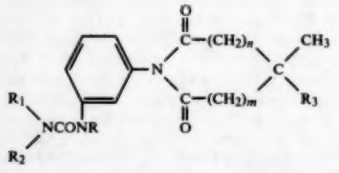
Eugene G. Teach, El Cerrito, Calif., assignor to Stauffer Chemical Company, Richmond, Calif.

Division of Ser. No. 232,330, Feb. 6, 1981, abandoned, which is a continuation of Ser. No. 910,405, May 30, 1978, abandoned. This application Dec. 14, 1981, Ser. No. 330,630

Int. Cl.³ A01N *43/40*; C07D *211/88*

U.S. Cl. 71—94 **15 Claims**

11. A method of controlling undesirable vegetation comprising applying to the locus thereof a herbicidally effective amount of the compound having the formula



wherein R is hydrogen or hydroxyl, R_1 is selected from the group consisting of methyl and hydrogen; R_2 is selected from the group consisting of methyl, ethyl, propyl and butyl and methoxy; R_3 is selected from the group consisting of hydrogen, methyl and ethyl; m is 0 or 1; and n is 1 or 2 provided that m + n equals 2.

4,400,203

SUBSTITUTED AMINO CARBOXYETHYL HALOACETAMIDE HERBICIDE ANTIDOTES

Hsiao-Ling M. Chin, Walnut Creek, Calif., assignor to Stauffer Chemical Company, Westport, Conn.

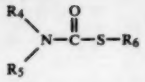
Filed Dec. 29, 1980, Ser. No. 220,925

Int. Cl.³ A01N *25/32*

U.S. Cl. 71—100 **6 Claims**

1. A herbicidal composition comprising:

(a) an herbicidally effective amount of a compound of the formula



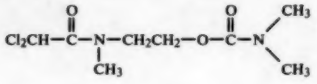
in which

R_4 is alkyl having 1–6 carbon atoms, inclusive;

R_5 is alkyl having 1–6 carbon atoms, inclusive; and

R_6 is alkyl having 1–6 carbon atoms, inclusive; and

(b) an non-phytotoxic antidotally effective amount of a compound of the formula



4,400,204

SUBSTITUTED BENZYLOXY CHLOROETHOXY ETHANE HERBICIDE ANTIDOTES

Raymond A. Felix, Richmond, Calif., assignor to Stauffer Chemical Company, Westport, Conn.

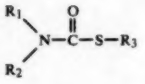
Filed Mar. 16, 1981, Ser. No. 244,453

Int. Cl.³ A01N *37/44*, *37/34*

U.S. Cl. 71—100 **13 Claims**

1. A composition comprising:

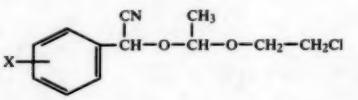
(a) an herbicidally effective amount of a thiocarbamate compound of the formula:



in which

R_1, R_2 and R_3 are each alkyl having 1–6 carbon atoms, inclusive;

(b) an non-phytotoxic antidotally effective amount of a compound of the formula



in which X is selected from the group consisting of hydrogen and halogen wherein the halogen is chlorine, bromine or iodine.

4,400,205

M-CYANOALKOXY-PHENYLUREAS HAVING HERBICIDAL ACTIVITY

Georg Pissiotas, Lörrach, Fed. Rep. of Germany, and Otto Rohr, Therwil, Switzerland, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

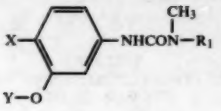
Continuation-in-part of Ser. No. 190,144, Sep. 24, 1980, abandoned, which is a continuation-in-part of Ser. No. 132,488, Mar. 21, 1980, abandoned. This application Jan. 18, 1982, Ser. No. 340,166

Claims priority, application Switzerland, Mar. 26, 1979, 2786/79

Int. Cl.³ A01N *47/30*; C07C *127/19*

U.S. Cl. 71—105 **10 Claims**

1. A compound of the formula:

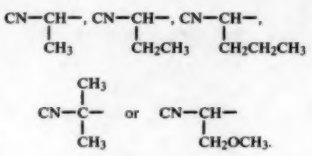


wherein

X is hydrogen or chloro;

R_1 is methyl or methoxy; and

Y is a cyanoalkyl group of the formula:



9. A method for controlling undesired plant growth, which comprises treating an area where plant-growth has to be controlled, with an effective amount of a m-cyanoalkoxyphenylurea of the formula I, according to claim 1.

4,400,206

PROCESS FOR ESTIMATING PARTICLE SIZE SEGREGATION OF BURDEN LAYER IN BLAST FURNACE TOP

Mikio Kondo, Chiba, Japan, assignor to Kawasaki Steel Corporation, Kobe, Japan

Filed May 28, 1981, Ser. No. 268,016

Int. Cl.³ C21B *5/00*

U.S. Cl. 75—41 1 Claim

1. A process for estimating a particle size segregation in a burden lyer stacked upwardly in a blast furnace, which comprises measuring a particle size distribution of a burden material before charging the burden material into the furnace to form a burden layer therein and measuring a layer thickness distribution of said burden layer after the charging of the burden material into the furnace, and estimating a particle size distribution at every position in said burden layer on the basis of said measured values, charging conditions and furnace operating conditions according to a simulation model of particle size segregation given by the following equation:

$$X_n = \frac{X^*_n e^{-\alpha l}}{1 - X^*_n (1 - e^{-\alpha l})}$$

wherein X_n is a cumulative weight fraction of particles having smaller size than n-th sieve opening, α is a particle size segregation constant, and l is a distance from a collision point of main falling trajectory against burden surface, to the flowing direction.

4,400,207

METHOD OF PRODUCING METAL ALLOYS

Aloyse Tanson, Luxembourg, Luxembourg, assignor to Continental Alloys S.A., Dommeldange, Luxembourg

Filed May 11, 1982, Ser. No. 377,035

Claims priority, application Luxembourg, May 13, 1981, 83362

I Cl.³ C22B *1/08*

U.S. Cl. 75—129 6 Claims

1. A process for preparing a pulverulent metal oxide as an alloying additive to a steel melt, which process consists essentially of the steps of mixing the oxide with a stoichiometric quantity of finely divided ferrosilicon, combining the mixture with about 5% by weight bentonite as a binder and with about 3% by weight water, agitating the mixture, and shaping the agitated mixture to briquettes.

4,400,208

PROCESS FOR THE PRODUCTION OF IRON, PHOSPHORUS, CARBON AND CHROMIUM BASED AMORPHOUS METAL ALLOYS, AND THE ALLOYS OBTAINED

Luc Ackermann, Pompey, France, assignor to Pont A Mousson S.A., Nancy, France

Filed Feb. 24, 1982, Ser. No. 351,689

Claims priority, application France, Feb. 27, 1981, 81 03978

Int. Cl.³ C22B *33/08*

U.S. Cl. 75—129 11 Claims

1. A process for the production of an iron-based amorphous metal alloy containing phosphorus, carbon, chromium, and iron comprising:

(a) preparing a liquid phase by melting cast iron, phosphorus and chromium, and

(b) rapidly cooling the resulting liquid phase metal alloy to obtain an amorphous structure.

4,400,209

ALLOY FOR MAKING HIGH STRENGTH DEEP WELL CASING AND TUBING HAVING IMPROVED RESISTANCE TO STRESS-CORROSION CRACKING

Takeo Kudo, Suita; Yasutaka Okada, Nishinomiya; Taishi Moroishi, Kobe; Akio Ikeda, Hyogo; Hiroo Ohtani, Kobe, and Kunihiko Yoshikawa, Suita, all of Japan, assignors to Sumitomo Metal Industries, Ltd., Osaka, Japan

Filed Jun. 1, 1982, Ser. No. 383,803

Claims priority, application Japan, Jun. 10, 1981, 56/89104; Jun. 11, 1981, 56/89959; Jun. 12, 1981, 56/90603; Jun. 15, 1981, 56/92030; Jun. 17, 1981, 56/93172

Int. Cl.³ C22C *19/05*

U.S. Cl. 420—443 23 Claims

1. An alloy for use in manufacturing high strength deep well casing and tubing having improved resistance to stress-corrosion cracking, the alloy composition consisting essentially of:

C:	≦ 0.1%	Si:	≦ 1.0%
Mn:	≦ 2.0%	P:	≦ 0.030%
S:	≦ 0.005%	N:	0–0.30%
Ni:	25–60%	Cr:	22.5–40%
Mo:	0–3.5% (excl.)	W:	0–7% (excl.)
Cr (%) + 10Mo (%) + 5W (%) ≧ 50%,			
1.0% ≦ Mo (%) + ½W (%) < 3.5%			
Cu:	0–2.0%	Co:	0–2.0%
Rare earths:	0–0.10%	Y:	0–0.20%
Mg:	0–0.10%	Ca:	0–0.10%
Fe and incidental impurities: balance.			

4,400,210

ALLOY FOR MAKING HIGH STRENGTH DEEP WELL CASING AND TUBING HAVING IMPROVED RESISTANCE TO STRESS-CORROSION CRACKING

Takeo Kudo, Suita; Yasutaka Okada, Nishinomiya; Taishi Moroishi, Kobe; Akio Ikeda, Hyogo; Hiroo Ohtani, Kobe, and Kunihiko Yoshikawa, Suita, all of Japan, assignors to Sumitomo Metal Industries, Ltd., Osaka, Japan

Filed Jun. 1, 1982, Ser. No. 383,797

Claims priority, application Japan, Jun. 10, 1981, 56-89105; Jun. 11, 1981, 56-89960; Jun. 12, 1981, 56-90604; Jun. 15, 1981, 56-92029; Jun. 17, 1981, 56-93173

Int. Cl.³ C22C *19/05*

U.S. Cl. 420—443 31 Claims

1. An alloy for use in manufacturing high strength deep well casing and tubing having improved resistance to stress-corrosion cracking, the alloy composition consisting essentially of:

C: ≦0.1%	Si: ≦1.0%
Mn: ≦2.0%	P: ≦0.030%
S: ≦0.005%	N: 0–0.30%
Ni: 25–60%	Cr: 22.5–35%
Mo: 0–7.5% (excl.)	W: 0–15% (excl.)
Cr (%) + 10Mo (%) + 5W (%) ≧ 70%	
3.5% ≦ Mo (%) + ½W (%) < 7.5%	
Cu: 0–2.0%	Co: 0–2.0%
Rare earths: 0–0.10%	Y: 0–0.20%
Mg: 0–0.10%	Ca: 0–0.10%

Fe and incidental impurities: balance.

4,400,211

ALLOY FOR MAKING HIGH STRENGTH DEEP WELL CASING AND TUBING HAVING IMPROVED RESISTANCE TO STRESS-CORROSION CRACKING

Takeo Kudo, Suita; Yasutaka Okada, Nishinomiya; Taishi Moroishi, Kobe; Akio Ikeda, Hyogo; Hiroo Ohtani, Kobe, and Kunihiko Yoshikawa, Suita, all of Japan, assignors to Sumitomo Metal Industries, Ltd., Osaka, Japan

Filed Jun. 1, 1982, Ser. No. 383,630

Claims priority, application Japan, Jun. 10, 1981, 56-89106; Jun. 11, 1981, 56-89961; Jun. 12, 1981, 56-90605; Jun. 15, 1981, 56-92028; Jun. 17, 1981, 56-93174

Int. Cl.[3] **C22C** *19/05, 38/18*

U.S. Cl. 420—443 **22 Claims**

1. An alloy for use in making high strength deep well casing and tubing having improved resistance to stress-corrosion cracking, the alloy composition consisting essentially of:

C: ≦0.1%	Si: ≦1.0%
Mn: ≦2.0%	P: ≦0.030%
S: ≦0.005%	N: 0–0.30%
Ni: 30–60%	Cr: 15–35%
Mo: 0–12%	W: 0–24%
Cr(%) + 10Mo(%) + 5W(%) ≧ 110%,	
7.5% ≦ Mo(%) + ½W(%) ≦ 12%	
Cu: 0–2.0%	Co: 0–2.0%
rare earths: 0–0.10%	Y: 0–0.20%
Mg: 0–0.10%	Ca: 0–0.10%
Fe and incidental impurities: balance.	

4,400,212

COBALT-CHROMIUM ALLOYS WHICH CONTAIN CARBON AND HAVE BEEN PROCESSED BY RAPID SOLIDIFICATION PROCESS AND METHOD

Ranjan Ray, Burlington, and Viswanathan Panchanathan, N. Billerica, both of Mass., assignors to Marko Materials, Inc., No. Billerica, Mass.

Filed Jan. 18, 1982, Ser. No. 340,481

Int. Cl.[3] **B22F** *1/00*

U.S. Cl. 75—251 **1 Claim**

1. Cobalt base alloy powders having composition $Co_aCr_bM_cM'_dC_eB_f$, wherein Co, Cr, C and B respectively represent cobalt, chromium, carbon and boron, M is one element from the group consisting of tungsten and molybdenum or mixtures thereof, M' is at least one element from the group consisting of iron, nickel, manganese and vanadium and mixtures thereof, and a, b, c, d, e, and f represent respectively atom percent of Co, Cr, M, M', C and B having the values a=25–73, b=20–35, c=2–20, d=0–10, e=10–17 and f=1–4 with the provisos that e+f may not exceed 20 and may not be less than 14 and the sum of a+b+c+d+e+f=100, said powders being made by the method comprising the following steps:

(a) forming a melt of said alloy,

(b) depositing said melt against a rapidly moving quench surface adapted to quench said melt at a rate in the range approximately 10^5 to 10^7°C./second and form thereby a rapidly solidified brittle strip of said alloys characterized by predominantly an amorphous structure and hardness values between 900 and 1350 kg/mm^2 and,

(c) Comminuting said strip into powders.

4,400,213

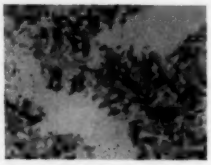
NOVEL HARD COMPOSITIONS AND METHODS OF PREPARATION

Haskell Sheinberg, Los Alamos, N. Mex., assignor to the United States of America as represented by the U.S. Department of Energy, Washington, D.C.

Filed Feb. 3, 1981, Ser. No. 231,085

Int. Cl.[3] **C22C** *29/00, 1/05, 19/03, 19/08*

U.S. Cl. 75—238 **42 Claims**



1. A precursor mixture useful for producing a very hard composition without requiring cobalt, said precursor mixture consisting essentially of:

(a) a minor amount of a boron carbide component selected from the group consisting of

(i) boron carbide and

(ii) boron and carbon, both present in amounts effective to form boron carbide in situ; and

(b) a major amount of a second mixture consisting of

(i) a first amount of a first component selected from the group consisting of tungsten, molybdenum, mixtures thereof and alloys thereof,

(ii) a second amount of a second component which is nickel, and

(iii) a third amount of a third component selected from the group consisting of iron, copper, and mixtures thereof,

wherein said minor amount is an amount corresponding to a weight percent of said precursor mixture within the range from about 1.5 to about 4.0 when said first component is tungsten and within the range from about 5.0 to about 6.3 when said first component is molybdenum, wherein said major amount is a weight percent of about 100 minus said minor amount, wherein said first amount is an amount within the range from about 90 to about 97 weight percent of said major amount when said first component is tungsten, wherein the sum of said second amount and said third amount is within the range from about 3 to about 10 weight percent of said major amount when said first component is tungsten, wherein molybdenum can be substituted for tungsten on a mole-for-mole basis, and wherein said first amount, said second amount, and said third amount are amounts which are effective to result in a composition having an average hardness of at least about 85 Rockwell A when said precursor mixture is subjected to appropriate hot-pressing conditions.

4,400,214

CONDUCTIVE PASTE

Yasuhiro Ogawa, Hirakata; Sankichi Shida, Nara; Katsuhiko Honjo, Takatsuki, and Tsunehiko Todoroki, Kusatsu, all of Japan, assignors to Matsushita Electric Industrial, Co., Ltd., Osaka, Japan

Filed May 7, 1982, Ser. No. 376,213

Claims priority, application Japan, Jun. 5, 1981, 56-87312; Jun. 5, 1981, 56-87314; Dec. 9, 1981, 56-199260

Int. Cl.[3] **C09D** *5/24*

U.S. Cl. 106—1.13 **12 Claims**

1. A conductive paste comprising a liquid vehicle having a

metal powder and a glass powder both dispersed therein, wherein said metal powder comprises an alloy powder, each particle thereof comprising copper, aluminum, and at least one of zinc and silver.

4,400,215

INK JET INK FORMULATION FOR REDUCED START-UP PROBLEMS

Theodore M. Cooke, Danbury; Robert A. Lin, New Town; Richard G. Whitfield, Brookfield, and Allan G. Hock, New Milford, all of Conn., assignors to Exxon Research and Engineering Co., Florham Park, N.J.

Filed Dec. 7, 1981, Ser. No. 327,994
Int. Cl.³ C09D *11/02*
U.S. Cl. 106—22 **36 Claims**

1. In an ink jet ink, the improvement comprising an ink formulated to substantially reduce or eliminate start-up problems when an ink jet apparatus is initially discharged, said ink comprising at least two fluid components, said components having been matched with respect to either their vapor pressures, boiling points, or evaporation rates to provide an ink that substantially maintains its initial formulation despite evaporation of said components.

19. In a method of substantially eliminating or at least reducing the tendency of an ink jet apparatus to improperly discharge during initial start-up, the improvement comprising the step of formulating an ink for said ink jet apparatus wherein at least two of its fluid components are matched with respect to either their vapor pressures, boiling points, or evaporation rates.

4,400,216

METHOD FOR PREPARING BLEED RESISTANT LITHOGRAPHIC INKS

Manohar L. Arora, Holland, Mich., assignor to BASF Wyandotte Corp., Wyandotte, Mich.

Continuation-in-part of Ser. No. 824,265, Aug. 15, 1977, abandoned. This application Sep. 21, 1977, Ser. No. 835,369
Int. Cl.³ C07D *11/02*
U.S. Cl. 106—23 **9 Claims**

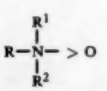
1. A method for imparting bleed resistance to a lithographic printing ink composition containing an azo red pigment and at least one vehicle selected from the class consisting of an alkyd resin, and a urethane-modified alkyd resin, said method comprising mixing a substantially dry flushed dispersion of the ink vehicle and pigment with an effective amount of at least one pigment wetting agent selected from the class consisting of:

an aliphatic monoamine having from 2 to about 20 carbon atoms;

an aliphatic polyamine having from 2 to about 36 carbon atoms wherein the ratio of carbon atoms to amino groups is from about 1 to about 18;

an aliphatic substituted aniline or naphthylamine wherein the aliphatic substituent contains from about 6 to about 20 carbon atoms;

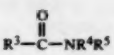
an amine oxide having the formula



wherein R, R^1 and R^2 are aliphatic groups having from 1 to about 20 carbon atoms but wherein the total number of carbon atoms is about 36 or less;

dehydroabietylamine or tetrahydrobietylamine;

an amide having the formula



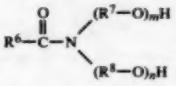
wherein R^3 is an aliphatic group having from about 12 to about 20 carbon atoms, R^4 is hydrogen or lower aminoalkyl, and R^5 is a lower aminoalkyl;

an amidine having from about 12 to about 20 carbon atoms;

an amidoxime having from about 12 to about 20 carbon atoms;

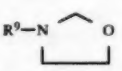
an oxime having from about 12 to about 20 carbon atoms;

an amide having the formula



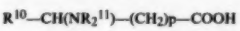
wherein R^6 is an aliphatic group having from about 12 to about 20 carbon atoms and R^7 and R^8 are alkylene groups having from 2 to about 4 carbon atoms, m is from 0 to about 5 and n is from 1 to about 5;

an oxazolidine having the formula



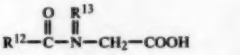
wherein R^9 is a polyacrylate residue having a molecular weight of from about 800 to about 3000;

an amino acid having the formula



wherein R^{10} is an aliphatic group containing from about 12 to about 20 carbon atoms, R^{11} may be independently hydrogen, methyl or ethyl, and p is from 0 to about 4;

an N-acyl amino acid having the formula



wherein R^{12} is an alkyl group having from about 12 to about 20 carbon atoms and R^{13} is an alkyl group having from 1 to about 4 carbon atoms;

salts of the aforesaid amines, with the proviso that when the wetting agent is an amide, the effective amount is from about 6% to about 9% of the weight of the pigment.

4,400,217

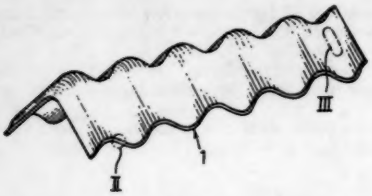
METHOD OF MANUFACTURING REINFORCED FIBERS FOR MINERAL STRUCTURAL MATERIALS, AND A STRUCTURAL ELEMENT OF A FIBER-REINFORCED MINERAL STRUCTURAL MATERIAL

Harald Kober, Zur-Nieden-Str. 14, 4690 Herne 2, Fed. Rep. of Germany

Division of Ser. No. 239,487, Mar. 2, 1981, Pat. No. 4,369,201. This application Jan. 17, 1982, Ser. No. 337,687
Claims priority, application Fed. Rep. of Germany, Mar. 4, 1980, 3008204
Int. Cl.³ C04B *7/353*
U.S. Cl. 106—93 **9 Claims**

1. A structural element, such as a pipe, a plate and the like, comprising a body of hydraulic binding material; and a plurality of reinforcing fibers, said reinforcing fibers being mineralized plant fibers manufactured by the method comprising the steps of providing a plurality of plant fibers having capillaries;

and mineralizing the plant fibers by opening the capillaries of the plant fibers, drying the plant fibers, impregnating the plant fibers with a lime water suspension, soaking the plant fibers



with a formaldehyde-containing water glass solution, and intermediately drying the plant fibers between said impregnating and soaking steps.

4,400,218

APPARATUS FOR THE CONTINUOUS MANUFACTURE OF GLUCOSE CONTAINING PRODUCTS

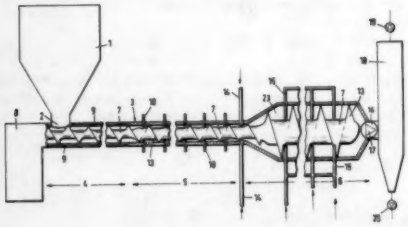
Klaus Koch, Laatzen, and Gerhard Syrbius, Grossburgwedel, both of Fed. Rep. of Germany, assignors to Hermann Berstorff Maschinenbau GmbH, Hanover, Fed. Rep. of Germany

Filed Mar. 5, 1982, Ser. No. 355,156

Claims priority, application Fed. Rep. of Germany, Mar. 9, 1981, 3108823

Int. Cl.³ C13K *1/02*

U.S. Cl. 127—1 **14 Claims**



1. Apparatus for the continuous manufacture of glucose-containing products, comprising:

(a) press cylinder means defining an intake region, a compression region and a catalyst injection region,

(b) a material intake opening communicating with said intake region for delivering said products to said press cylinder means,

(c) a valved material output opening adjacent the end of said injection region and openable when a preselected pressure in said press cylinder means is exceeded,

(d) a rotary screw conveyor means mounted in said press cylinder means and extending through said intake, compression and injection regions, the construction of said screw conveyor means and said press cylinder means in said injection region being such that the cross-sectional area and thus volume of said injection region available to material containment in substantially greater than in said compression region,

(e) a plurality of pins extending radially inwardly through said press cylinder means in said compression region to a position adjacent the base of the thread of said screw conveyor means, the helical flights of said screw conveyor means being radially interrupted in the regions of said pins to permit rotation of said conveyor means, whereby high pressure is built up in said compression chamber with consequent disintegration of the material, and

(f) catalyst injection nozzles extending through said press cylinder means in at least said injection region for admitting catalyst to such region, the catalyst and relatively greater cross-sectional volume in the injection region further intensifying the mixture and consequent disintegration of the material in said injection region prior to discharge.

4,400,219

PLANT FOR CONTINUOUSLY PREPARING STARCH GLUE

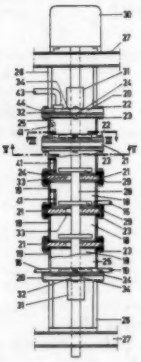
Robert Vanderputten, Geraardsbergen; Oscar Vandewalle, Affligem, and Julien Van Den Broeke, Nieuwerkerken, all of Belgium, assignors to "Graanderivatan Raffinaderijen Amylum,"in het kort: "G.R. Amylum," vroeger "Glucoseries reunies" genoemd, Brussels, Belgium

Filed Sep. 29, 1981, Ser. No. 306,728

Claims priority, application Belgium, Oct. 31, 1980, 2/58831

Int. Cl.³ C13L *1/08*; C08L *3/00*

U.S. Cl. 127—23 **7 Claims**



1. A reactor for continuously preparing a two-component starch glue, said reactor having a geometrical axis and comprising:

a. a plurality of cells adjacent in the direction of said geometrical axis, said cells forming,

a first end cell at one end of said axis,

a second end cell at the other end of said axis and

intermediate cells between said first end cell and said second end cell,

said cells having each a cylindrical inner wall

b. partitions between adjacent cells, each partition being provided with a limited passage opening,

c. an inlet for a primary starch fraction, said inlet opening into said first end cell,

d. an inlet for an agent for gelatinizing said primary starch fraction, said inlet opening into said first end cell,

e. an inlet for a secondary starch fraction, said inlet opening into one of said intermediate cells,

f. an outlet for glue, which outlet connects to said second end cell,

g. a stirrer comprising:

a shaft rotatably mounted in the reactor and extending parallel to the reactor axis, through the passage opening in each of the partitions between the cells, said shaft having a geometrical axis lying at a distance from the reactor axis,

in each cell a stirring disc mounted on said shaft, said disc having its center on the geometrical axis of the shaft and being provided with teeth on its circumference, and

a drive mechanism connected to said shaft,

h. means for providing a primary starch fraction, means for feeding the primary starch fraction to the inlet of subsection c, means for providing an agent for gelatinizing the primary starch fraction, means for feeding the agent for gelatinizing the primary starch fraction to the inlet of subsection d, means for providing a secondary starch fraction, and means for feeding the secondary starch fraction to the inlet of subsection e, and

i. in the intermediate cell into which opens the inlet for the secondary fraction, a baffle-plate mounted on the inner wall of the cell, opposite to the stirrer shaft axis with respect to the geometrical axis of the reactor, said baffle-plate extending in parallel relationship with said geometrical axis of the reactor, the first end cell into which opens the inlet for a primary starch fraction and cells, if any, between the first end cell and the intermediate cell into which opens the inlet for the secondary starch fraction being free of baffle-plates on their inner wall.

4,400,220

SUPPRESSION OF RESPIRABLE DUST WITH FOAM

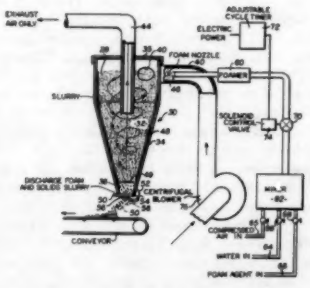
Howard W. Cole, Jr., 12 Vale Dr., Mountain Lakes, N.J. 07046

Continuation of Ser. No. 218,201, Dec. 19, 1980, abandoned, which is a continuation of Ser. No. 42,634, May 25, 1979, abandoned, which is a continuation of Ser. No. 849,264, Nov. 7, 1977, abandoned, which is a continuation of Ser. No. 696,733, Jun. 16, 1976, abandoned, which is a division of Ser. No. 527,812, Nov. 27, 1974, Pat. No. 4,000,992. This application Mar. 17, 1982, Ser. No. 358,843

The portion of the term of this patent subsequent to Jan. 4, 1994, has been disclaimed.

Int. Cl.³ B08B *15/00*

U.S. Cl. 134—18 **13 Claims**



12. The method of substantially eliminating respirable dust having particles as small as one micron in an open zone of dust-generation within an active coal-handling or the like operation, which method comprises mixing air, water and surfactant with such turbulence and flow in a confining region prior to discharge into said zone as to project the mixture as a foam into the open zone, the foam having bubbles of less than 0.015 inch diameter within said zone to permeate the zone so that said bubbles burst on contact with and wet at least the respirable-dust components of such dust generation.

4,400,221

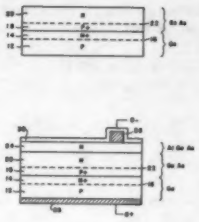
FABRICATION OF GALLIUM ARSENIDE-GERMANIUM HETEROFACE JUNCTION DEVICE

W. Patrick Kahilly, Spring Valley, Ohio, assignor to The United States of America as represented by the Secretary of the Air Force, Washington, D.C.

Division of Ser. No. 281,437, Jul. 8, 1981. This application Oct. 26, 1982, Ser. No. 436,869

Int. Cl.³ H01L *21/263, 21/208, 21/225, 31/06*

U.S. Cl. 148—1.5 **16 Claims**



1. The method of forming a semiconductor device comprising the steps:

a. starting with a germanium wafer having a given type of conductivity;

b. doping a region adjacent one surface of said wafer with a group Ia dopant selected from lithium, sodium and potassium;

c. growing a layer of a III-V compound including gallium and arsenic on said one surface during which said group Ia dopant diffuses into the growing layer, the growing layer being doped for a given type of conductivity;

whereby a heteroface junction is formed at said one surface with the regions adjacent thereto having N+ conductivity in the III-V compound, a lower junction is formed in the germanium, and an upper junction is formed in the III-V compound.

4,400,222

METHOD FOR TREATING SURFACES

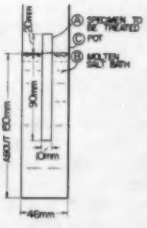
Norimasa Uchida, Matsue, Japan, assignor to Hitachi Metals, Ltd., Tokyo, Japan

Filed Jun. 16, 1981, Ser. No. 274,276

Claims priority, application Japan, Jun. 17, 1980, 55-81842; Jun. 17, 1980, 55-81843; Aug. 6, 1980, 55-108114; Aug. 6, 1980, 55-108115; Aug. 6, 1980, 55-108116; Aug. 6, 1980, 55-108117; Jun. 1, 1981, 56-84195; Jun. 1, 1981, 56-84196

Int. Cl.³ B44D *5/12*

U.S. Cl. 148—6.11 **10 Claims**



1. A surface-treating method for forming the carbide or composite carbide of a Group Va element and/or Group VIa element on the surface of an iron or iron alloy material to be treated, characterized by immersing said material in a molten bath prepared by adding to (i) a salt bath agent consisting of a

mixture of $BaCl_2$ and 5 to 15 mol % of $Na_2B_4O_7$, (ii) 5 to 50 weight % of a metal cementing agent consisting of one or more substances selected from the group consisting of the Group Va element, a substance containing the Group Va element, the Group VIa element and a substance containing the Group VIa element.

4,400,223

HOT ROLLED STEEL PRODUCT AND METHOD FOR PRODUCING SAME

William E. Heitmann, Crown Point, and Richard J. Sulewski, Hebron, both of Ind., assignors to Inland Steel Company, Chicago, Ill.

Filed Aug. 21, 1981, Ser. No. 294,908
Int. Cl.³ C21D *8/02*
U.S. Cl. 148—12 F **13 Claims**

1. A hot-rolled steel strip having a composition consisting essentially of, in wt.%:

carbon—0.04–0.08
manganese—1.1–1.6
columbium—from about 0.03 to less than about 0.08
vanadium—0.08–0.1
nitrogen—0.013–0.020
silicon—less than 0.05
sulfur—less than 0.02
phosphorus—less than 0.02
aluminum—0.02–0.10
iron—essentially the balance

said steel strip having a microstructure consisting essentially of a ferrite matrix as a major portion and scattered pearlite as a minor portion;

said composition including a sulfur controlling agent;

said microstructure having a ferrite grain size at least as fine as ASTM 12;

said steel strip having a yield strength of at least 80 ksi (545 MPa), and an elongation of at least 20% in 2 inches (5 cm).

4,400,224

METHOD FOR FORMING A CARBIDE LAYER ON THE SURFACE OF A FERROUS ALLOY ARTICLE OR A CEMENTED CARBIDE ARTICLE

Tohru Arai, Toyoake; Hironori Fujita, Aichi, and Yasuo Takada, Nagoya, all of Japan, assignors to Kabushiki Kaisha Toyota Chuo Kenkyusho, Aichi, Japan

Filed Apr. 2, 1982, Ser. No. 365,022
Claims priority, application Japan, Apr. 20, 1981, 56-59486
Int. Cl.³ C21D *1/48*
U.S. Cl. 148—15 **20 Claims**

1. A method for forming a carbide layer on the surface of a carbon-containing ferrous alloy article or a cemented carbide article, comprising the steps of:

(a) preparing a treating bath comprising molten boric acid or borate, a carbide-forming element dissolved therein and 5 to 20% by weight, based on the whole weight of the bath, of alumina;

(b) keeping said treating bath at a temperature within the range from 1050° C. to a temperature lower than the melting point of the article to be treated;

(c) immersing the article into the molten treating bath;

(d) maintaining said article in said molten treating bath to form a carbide layer of said carbide-forming element on the surface of said article; and

(e) removing said article from said molten treating bath.

11. A treating material for forming a carbide layer on the surface of a carbon-containing ferrous alloy article or a cemented carbide article which is composed of boric acid or a borate, a carbide-forming element and from 5 to 20% by weight, based on the whole weight of the treating material, of alumina.

4,400,225

CR-MO STEEL FOR USE AS VERY THICK PLATES OF 75 MM OR MORE FOR OIL REFINERY, COAL LIQUEFACTION AND COAL GASIFICATION EQUIPMENT

Masaaki Ishikawa; Syuzo Ueda, and Makoto Imanaka, all of Chiba, Japan, assignors to Kawasaki Steel Corporation, Hyogo, Japan

Filed Aug. 31, 1981, Ser. No. 298,147
Claims priority, application Japan, Aug. 29, 1980, 55-118359
Int. Cl.³ C22C *38/32*
U.S. Cl. 148—36 **1 Claim**

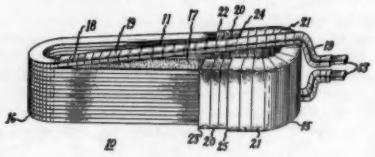
1. A Cr-Mo steel for use as 75 mm or more thick plates for oil refinery, coal liquefaction and coal gasification equipment, consisting of 0.09 to 0.17 wt% of carbon, 0.03 to 0.50 wt% of silicon, 0.45 to 0.70 wt% of manganese, more than 2.00 up to 3.40 wt% of chromium, 0.80 to 1.20 wt% of molybdenum, 0.035 to 0.1 wt% of aluminum, 0.0010 to 0.0040 wt% of boron and the balance iron and inevitable impurities, said steel being in bainitic condition.

4,400,226

METHOD OF MAKING AN INSULATED ELECTROMAGNETIC COIL

Raymond J. Horrigan, deceased, late of Erie, Pa., by Doris C. Horrigan, executrix, assignor to General Electric Company, Erie, Pa.

Division of Ser. No. 283,851, Jul. 16, 1981, Pat. No. 4,376,904. This application Sep. 30, 1982, Ser. No. 429,731
Int. Cl.³ H01B *13/08*; H01H *85/22*; H02K *3/40*
U.S. Cl. 156—56 **5 Claims**



1. For insulating a helical electromagnetic coil comprising a plurality of turns, the two turns at opposite ends of the coil having distal sections that are integrally joined, respectively, to a pair of terminal leads extending beyond the boundary of the coil to provide means for connecting the coil in an electrical circuit, an improved method comprising the steps of:

a. wrapping a fluorinated ethylene propylene resin-coated polyimide tape around the distal section of each end turn of said coil and around each of said terminal leads, thereby covering the bare surfaces of said sections and said leads with first layers of such tape;

b. covering said first layer on each distal section and each terminal lead with another layer of said tape;

c. inserting between adjacent turns of said coil thin laminae of fluorinated ethylene propylene resin-impregnated glass cloth which conform to the shape of said turns;

d. wrapping said tape around a first part of said coil to form an inner layer of such tape on the exposed surfaces of said first part, said first part excluding the distal sections of both of said end turns but including regions of said coil subtending each of said distal sections;

e. covering a central portion of said inner layer on said first part of said coil with at least one additional layer of said tape;

f. wrapping said tape around a second part of said coil so as to cover said second part with another inner layer of tape, said second part including a first portion of the distal section of each of said end turns and all exposed surfaces of said coil that were not covered by the first-mentioned inner layer of tape;

g. covering said last-mentioned inner layer on said second

part of said coil with at least one additional layer of said tape which is wrapped so as to overlap any previously uncovered portions of the inner layer of tape on said first part of said coil and the layers of tape covering a second portion of the distal section of each end turn of said coil;

h. heating said coil to at least the melting point of said resin;

i. applying pressure to the external surfaces of the various layers of tape on said coil;

j. cooling said coil to allow said layers of tape and said laminae to bond to the respectively contiguous turns of said coil; and

k. removing said pressure after said resin resolidifies.

4,400,227

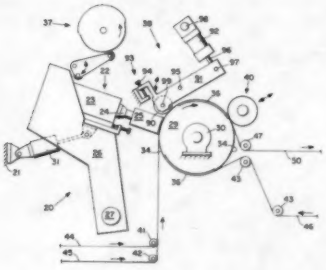
DYNAMIC ULTRASONIC LAMINATING APPARATUS HAVING POST-BONDING PRESSURE ROLL, AND CONCOMITANT METHOD

Coenraad E. Riemersma, Cincinnati, Ohio, assignor to The Procter & Gamble Company, Cincinnati, Ohio

Filed Jan. 26, 1982, Ser. No. 342,699

Int. Cl.³ B29C *27/08;* B32B *31/20*

U.S. Cl. 156—73.1 **8 Claims**



1. An improved ultrasonic web laminating apparatus which apparatus includes an ultrasonic horn and a rotating anvil cylinder between which a plurality of webs which are subject to ultrasonic bonding are bonded as they are forwarded therebetween and thereby converted into a laminated web, said improvement comprising a pressure roll disposed adjacent the downstream edge of the ultrasonic horn, and means for biasing the pressure roll towards the anvil cylinder to apply a post-bonding compression to said laminated web prior to the ultrasonic bonded regions thereof becoming fully set upon cooling, and prior to said laminated web being disassociated from the anvil cylinder.

7. An improved method of dynamically ultrasonically bonding a plurality of webs to form a laminate thereof which method includes the step of ultrasonically bonding the webs together as they are forwarded between an ultrasonic horn and an anvil, said improvement comprising the step of applying a post-bonding compression force to the ultrasonically bonded regions of the laminate before the ultrasonically formed bonds become fully set upon cooling, and prior to the laminate being disassociated from the anvil.

4,400,228

METHOD OF MAKING LENGTHS OF FLEXIBLE INSULATED AIR DUCT WITH END COLLARS

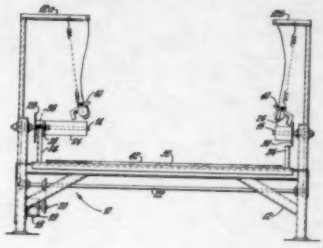
Gary F. Gentry, Bakersfield, Calif., assignor to Owens-Corning Fiberglas Corporation, Toledo, Ohio

Filed Jun. 30, 1982, Ser. No. 393,959

Int. Cl.³ B65H *81/00*

U.S. Cl. 156—144 **2 Claims**

1. A method of making lengths of flexible insulated air duct bendable around corners without collapsing and having end collars, the method comprising telescoping a tubular jacket of flexible plastic film over a free end portion of a cantilevered first mandrel adjacent one end of a machine and gathering the jacket adjacent a mounted end portion of the first mandrel, telescoping a first duct end collar over the free end portion of the first mandrel and securing it in position, telescoping a second duct end collar over a free end portion of a cantilevered second mandrel adjacent another end of the machine and coaxial with the first mandrel and securing the second duct end collar in position, telescoping opposite end portions of a flexible helically reinforced core respectively over and strapping them respectively to the duct end collars, wrapping a flexible insulation blanket around the core and taping opposite end portions of the blanket in place, pulling an end of the tubular jacket on the first mandrel over the insulation blanket all along the length thereof to extend the gathered jacket full length and encase the insulation blanket therein, releasing the duct end collars respectively from the mandrels, and removing the collared duct from the machine.



4,400,229

PROCESS FOR THE PREPARATION OF PHENOLIC RESIN-CONTAINING DISPERSIONS AND THEIR USE AS ADHESIVES

Christopher G. Demmer, Cherry Hinton; Roger Francombe, Sawston; Edward W. Garnish, Saffron Walden, and Derek J. R. Massy, Linton, all of England, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

Filed Dec. 2, 1981, Ser. No. 326,961

Claims priority, application United Kingdom, Dec. 13, 1980, 8040002

Int. Cl.³ C09J *5/02*

U.S. Cl. 156—307.5 **10 Claims**

1. A process for the preparation of aqueous dispersions which comprises

(a) dissolving a solid thermoplastic polymeric material or a solid rubber in a phenol or mixture of phenols at a temperature of 30° to 120° C., under conditions such that the phenol or mixture of phenols is in a liquid state,

(b) by adding at least one member selected from nonionic surface active agents, anionic surface active agents, and protective colloids,

(c) adjusting the resulting mixture to a pH above 7 by addition of a base,

(d) adding aqueous formaldehyde solution, or a formaldehyde donor, to a molar ratio of phenol to formaldehyde within the range 1:1 to 1:3,

(e) adding water if necessary, to bring the mixture to a water content of at least 20% by weight, calculated on the weight of the phenol, and

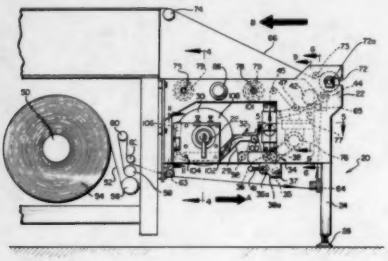
(f) heating the mixture and allowing it to react to form a phenolic resole.

10. A method of bonding surfaces together which comprises coating at least one surface with an aqueous dispersion prepared by a process as claimed in claim 1, allowing or causing the dispersion to dry, bringing the surfaces into contact, and heating the assembly to cure the phenolic resole contained in the dispersion.

4,400,230
LABEL INDEXING AND APPLICATOR APPARATUS

Ihor Wyslotsky, Alsip, Ill., assignor to Labless, Israel, Rosh Pina, Israel

Filed Nov. 23, 1981, Ser. No. 323,994
Int. Cl.[3] B65B *41/18*
U.S. Cl. 156—361 33 Claims



1. A label indexing and applicator appartus for bonding labels, in controlled index from a rolled strip of flexible and stretchable label stock having the labels longitudinally separated on the strip by detectable label divider indicia to a surface of a substrate stock, said apparatus comprising:

an exteriorly disposed apparatus frame;

strip label stock storage shaft means carried by said exterior frame for rotationally supporting a roll of the flexible and stretchable strip label stock and having a substantially horizontal axis of rotation sufficient for unrolling the labels tangentially of the roll and upstream in a first direction for traveling longitudinally of said frame;

label strip stock straightening means carried by said exterior frame and disposed upstream said strip label stock shaft storage means for applying and maintaining a tension on the strip label stock sufficient to maintain said strip label stock in an essentially unwrinkled state;

a first grip nip roller carried by said exterior frame and disposed upstream said label strip straightening means, said first grip nip roller engaging the strip label stock therearound;

a second grip nip roller carried by said exterior frame and disposed adjacent said first grip nip roller, said second grip nip roller being engageable with said first grip nip roller to define a gripping nip through which the strip label stock is threadably disposed and engaged to exert a transverse grip by means of said gripping nip on the strip label stock sufficient to bind and firmly hold the strip label stock therein, whereby the strip label stock may pass therethrough only upon turning of said grip nip rollers;

sensor means carried by said exterior frame and disposed upstream of said gripping nip and opposite thereof for detecting the presence and location at a selected time of the transparent label divider portions separating the labels on the strip label stock;

a first heat nip roller carried by said exterior frame and disposed upstream of said sensor means;

a second heat nip roller carried by said exterior frame and engageable with said first heat nip roller, at least one of said heat nip rollers being heated to define a heat nip for threadably engaging the strip label stock therethrough;

heat nip engagement means carried by said exterior frame for engaging said heat nip rollers;

substrate stock storage shaft means for rotationally supporting and paying out the substrate stock from a roll thereof;

substrate stock directional roller means carried by said exterior frame for directing the substrate stock for disposition within and for threadable engagement by said heat nip and in contact therein with the strip label stock and the substrate stock are bonded together to form a laminate at and by the heat nip;

cooling means carried by said exterior frame for cooling the bonded strip label stock and substrate laminate;

stock pulling means disposed upstream said cooling means for exerting a pulling force on the bonded strip label stock and substrate laminate, and for thereby separately pulling the strip label stock and subtrate stock in an upstream direction through the label applicator apparatus at a selected speed;

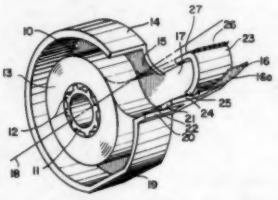
electric motor brake means carried by said exterior frame and connected to one of said nip rollers for turning said nip roller to permit the gripped strip label stock to pass therethrough at a controlled variable linear speed, and thereby to effect a differential stretch thereon corresponding to the speed of rotation of said nip roller; and

control means connected to said sensor means and said electric motor brake means for controlling and varying the speed of said electric motor brake means in accordance with the presence and location at a selected time of the transparent label divider portions separating the labels on the strip label stock to differentially stretch the strip label stock to effect registration of the bonded labels on the substrate stock.

4,400,231
TAPE DISPENSER/APPLICATOR

Andrew M. Martin, The Boston Core Group, 77 Gibbs St., Brookline, Mass. 02146, assignor to Andrew McG. Martin, Boston, Mass.

Filed Dec. 29, 1980, Ser. No. 220,273
Int. Cl.[3] B32B *31/04, 35/00*
U.S. Cl. 156—527 4 Claims



1. A dispenser/aplicator for dispensing and applying tape from a tape roll, the tape having an adhesive side and a non-adhesive side, said dispenser/applicator comprising:

A. an integral planar frame including a main frame means and a contiguous coplanar support means extending from said main frame means and in the plane thereof;

B. hub means transverse to and integral with said main frame means for mounting the tape roll;

C. tape rest means extended normally to and integrally formed with said coplanar support means, said tape rest means consisting of, respectively, first and second spaced, coplanar arms extending from said coplanar support means for contacting, with corresponding surfaces thereof, only the adhesive side of the tape when said dispenser/applicator is not being used;

D. pressing surface means extended normally to and integrally formed with said coplanar support means, said pressing surface means being spaced from said tape rest means for engaging the non-adhesive side of the tape as it is drawn past said arms of said tape rest means thereby to press the adhesive side of the tape against an object;

E. fixed cutting means extended normally to said coplanar support means adjacent said pressing surface for cutting the tape, and

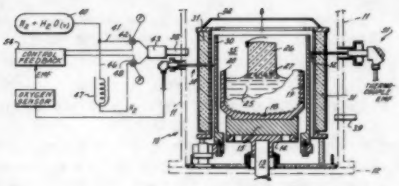
F. shroud means about the periphery of said main frame means and extending transversely from said main frame means, said shroud means having a flattened base portion for defining a supporting surface, said tape rest means lying in a plane that is substantially parallel to said supporting surface and spaced therefrom to locate said tape rest means in a plane juxtaposed to said hub means thereby

to prevent the end of the tape from reaching the plane of the supporting surface after it is cut, said shroud means having an opening therethrough at said coplanar support means, one termination of said shroud means being formed to engage said tape rest means.

4,400,232
CONTROL OF OXYGEN- AND CARBON-RELATED CRYSTAL DEFECTS IN SILICON PROCESSING

Paul D. Ownby, Rolla, and Paul E. Grayson, Joplin, both of Mo., assignors to Eagle-Picher Industries, Inc., Cincinnati, Ohio

Filed Nov. 9, 1981, Ser. No. 319,638
Int. Cl.³ C30B *33/00*
U.S. Cl. 156—601 **9 Claims**



1. In a process of producing a solid state silicon device wherein a silicon body is exposed in a processing chamber to elevated temperatures as a step in the production of said device,

a method for reducing the formation of oxygen- and carbon-related defects in the silicon body, comprising,

placing the silicon body in said processing chamber and heating the body to said elevated temperatures,

admitting to said chamber a stream of an oxygen-containing first gas which will dissociate to form oxygen and a second gas which is inactive with respect to the silicon body in the chamber,

also admitting a stream of said second gas to said chamber, the two gases comprising a buffer gas mixture in the chamber,

establishing substantially equilibrium conditions of temperature and pressure in said chamber and partially dissociating said first gas at such conditions to form oxygen therein,

sensing the partial pressure of oxygen in the chamber,

providing and maintaining a ratio between the rates of flow of the first and second gases in response to said sensing, which ratio establishes an oxygen partial pressure in said chamber that is no greater than about 10^{-6} atmosphere and at which the density of oxygen-related defects in said device is acceptably low, and

cooling the body and removing it from the chamber.

4,400,233
SYSTEM AND METHOD FOR CONTROLLING AN ETCH LINE

Hemmige V. Rangachar, Newtown, and Kenneth D. Powell, Lancaster, both of Pa., assignors to RCA Corporation, New York, N.Y.

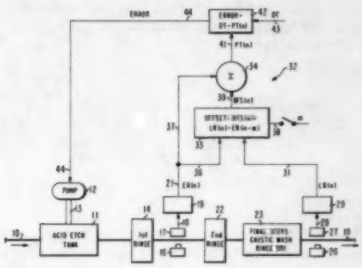
Filed Nov. 12, 1982, Ser. No. 441,229
Int. Cl.³ C23F *1/02*; B44C *1/22*; C03C *15/00, 25/06*
U.S. Cl. 156—626 **10 Claims**

1. A method of etching a pattern of apertures in an etchable sheet of material comprising the steps of:

passing said sheet through an etching process and measuring the actinic energy transmission capability of the etched apertures to obtain an early energy transmission signal;

passing said sheet through at least one additional processing step including drying said material, and measuring the actinic energy transmission capability of the etched apertures to obtain a late energy transmission signal;

utilizing said early and late transmission signals to obtain an error signal; and

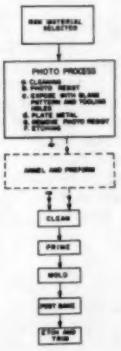


using said error signal to control a parameter of said etching process.

4,400,234
METHOD OF MANUFACTURING ELECTRICAL CONNECTOR

William E. Berg, Beaverton, Oreg., assignor to Tektronix, Inc., Beaverton, Oreg.

Continuation of Ser. No. 187,696, Sep. 16, 1980, abandoned, which is a division of Ser. No. 7,445, Jan. 29, 1979, Pat. No. 4,255,003, which is a division of Ser. No. 861,066, Dec. 15, 1977, Pat. No. 4,150,420, which is a continuation of Ser. No. 631,591, Nov. 13, 1975, abandoned. This application Apr. 15, 1982, Ser. No. 368,795
Int. Cl.³ C23F *1/02*; B44C *1/22*; C03C *15/00, 25/06*
U.S. Cl. 156—634 **13 Claims**



1. The process of securing metal contacts to elastomeric material comprising:

using a metal having mild spring characteristics and medium yield strength;

subjecting said metal to a photo process for forming said contacts; injecting an elastomeric material onto said photo processed metal according to a generated pattern at a temperature above room temperature;

outgassing the injected material and metal by baking at a temperature above room temperature; and

etching the outgassed injected material and metal to remove excess material leaving the metal contacts secured to the elastomeric material.

4,400,235

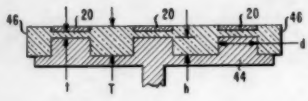
ETCHING APPARATUS AND METHOD

Gerald A. Coquin, New Providence; Joseph M. Moran, Berkeley Heights, and Gary N. Taylor, Bridgewater, all of N.J., assignors to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed Mar. 25, 1982, Ser. No. 362,045

Int. Cl.³ H01L *21/306;* **B44C** *1/22;* **C03C** *15/00, 25/06*

U.S. Cl. 156—643 **17 Claims**



10. A method of making a device by processing a workpiece in accordance with a fabrication sequence that includes at least one dry etching step in which the workpiece is positioned on one of two spaced-apart electrodes in the reaction chamber of an etching system, said one electrode having a planar base portion with a post region thereon, said method comprising

mounting said workpiece on said one electrode overlying said post region and in registry therewith to maintain the front surface of said workpiece in substantially the same plane as that of surrounding dielectric material disposed on said one electrode, the thickness of said surrounding dielectric material being substantially greater than the thickness of any dielectric material interposed between the back surface of said workpiece and said post region,

introducing a gas into said chamber, and

establishing an electric potential between said electrodes to form in said chamber a substantially uniform electric field focussed on said workpiece thereby to convert said gas into a plasma that contains species effective to react with selected portions of said front surface in a substantially uniform and contamination-free manner to etch said portions in a relatively rapid way.

4,400,236

ROTATING DISC EVAPO-EXTRUSION PROCESS AND APPARATUS

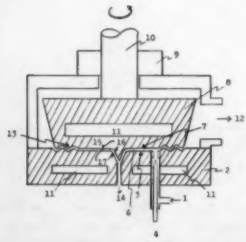
Yoshimi Hanamura; Masahiro Yuyama, and Akira Sakuramoto, all of Niihama, Japan, assignors to Sumitomo Chemical Company, Limited, Osaka, Japan

Filed Aug. 24, 1981, Ser. No. 295,304

Claims priority, application Japan, Aug. 27, 1980, 55-118905; Aug. 27, 1980, 55-118906; Mar. 5, 1981, 56-32158

Int. Cl.³ B01D *1/22, 1/30;* **B01J** *19/18*

U.S. Cl. 159—2 E **27 Claims**



1. A rotating disc evapo-extrusion process for removing volatile components from a thermoplastic polymer composition containing volatile components, which comprises

applying a pressure sufficient to maintain the composition in substantially a liquid state and applying all or a part of the heat necessary for evaporating the volatile components to the composition,

supplying the pressured and heated composition to a rotating disc evapo-extrusion machine, in which a rotor and a stator are provided with substantially parallel opposed faces separated by a fixed space and the inner pressure is maintained at from 5 Torr to 1,500 Torr, said pressured and heated composition being supplied through a pore in said stator and being directly blown onto the face of the rotor,

thereby separating and recovering a majority of the volatile components from the peripheral part of the rotor, and

transferring, with heating, the polymer composition toward the central area of the face of the rotor by a hydrodynamic pressure produced by the rotation of the rotor, whereby remaining volatile components are separated and recovered from the peripheral part of the rotor and polymer composition is recovered from an outlet which is provided at the central part of the face of the stator.

4,400,237

PROCESS FOR BLEACHING CELLULOSE WITH ORGANIC PERACID

Horst Krüger, Darmstadt; Wilhelm Berndt, Frankfurt, and Hans U. Suss, Rodenbach, all of Fed. Rep. of Germany, assignors to Degussa Aktiengesellschaft, Frankfurt, Fed. Rep. of Germany

Filed Feb. 6, 1981, Ser. No. 232,217

Claims priority, application Fed. Rep. of Germany, Feb. 16, 1980, 3005947

Int. Cl.³ D21C *9/16*

U.S. Cl. 162—76 **8 Claims**

1. A process for the bleaching of cellulose using peroxide in the alkaline range and an organic percarboxylic acid in the acid range werein a bleaching step with peroxide follows the bleaching step with the percarboxylic acid comprising (1) carrying out the bleaching with aqueous percarboxylic acid containing 5 to 40 weight % of percarboxylic acid and 10 to 50 weight % hydrogen peroxide, said percarboxylic acid having been produced from an organic carboxylic acid having a concentration of 50 to 100 weight % by reaction with 30 to 90 weight % hydrogen peroxide in the presence of a mineral acid at a temperature between 20° and 100° C. and (2) adding to the cellulose immediately after the percarboxylic acid bleaching step and without an intermediate washing an amount of aqueous alkali needed for carrying out an alkali bleaching step with said peroxide and then carrying out the peroxide bleaching without further addition of peroxide with said hydrogen peroxide.

4,400,238

APPARATUS FOR STRETCHING AN ENDLESS WEB

Peter P. Stanislaw, Highland Lakes, and James S. Hicks, Sussex, both of N.J., assignors to Morrison Machine Co., Paterson, N.J.

Filed Apr. 29, 1982, Ser. No. 373,113

Int. Cl.³ D21F *7/00;* **D06C** *3/06*

U.S. Cl. 162—273 **17 Claims**

1. Apparatus for processing an endless web, comprising:

support means for supporting said endless web at a first location thereof;

a roll for supporting said endless web at a second location thereof, said roll having first and second ends;

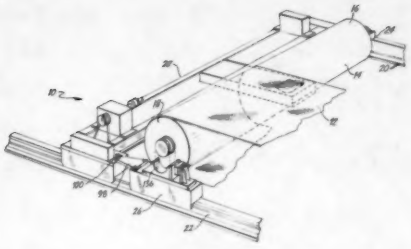
first and second track means extending between said first and second locations;

first and second carriage means engaged to said first and said second track means respectively for rotatably supporting said first and second ends of said roll respectively in a normal operating position and moving said roll relative to said support means along said track means;

bridge means connecting said first and second carriage means; and

means mounted to said bridge means for lifting said roll at a

location between said first and second ends so that said roll is supported by said lifting means and said first carriage means whereby said endless web may be inserted or removed over said second end of said roll.



4,400,239

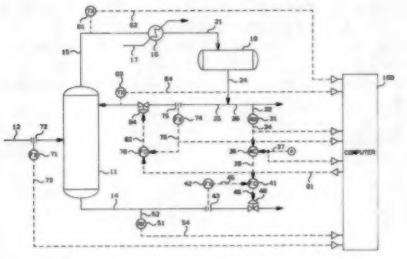
CONSTRAINT CONTROL OF A FRACTIONAL DISTILLATION PROCESS

James W. Hobbs, Sweeny, Tex., assignor to Phillips Petroleum Company, Bartlesville, Okla.

Filed Oct. 30, 1981, Ser. No. 315,601

Int. Cl.³ B01D *3/42*

U.S. Cl. 196—132 **5 Claims**



1. Apparatus comprising:

a fractional distillation column means;

means for passing a feed mixture containing at least first and second components into said fractional distillation column means;

means for withdrawing an overhead vapor stream, having a substantially increased concentration of said first component with respect to the concentration of said first component in said feed mixture, from an upper portion of said fractional distillation column means;

means for condensing at least a portion of said overhead vapor stream;

accumulator means;

means for passing the resulting at least partially condensed overhead stream into said accumulator means;

means for withdrawing condensate from said accumulator means and for passing a first portion of the thus withdrawn condensate into an upper portion of said fractional distillation column means as an external reflux therefor and for passing a second portion of the thus withdrawn condensate as an overhead product stream;

means for withdrawing a bottoms product stream, having a substantially increased concentration of said second component with respect to the concentration of said second component in said feed mixture, from a lower portion of said fractional distillation column means;

means for manipulating the flow rate of said external reflux in response to the current value of a periodically updated first signal which is representative of the desired flow rate of said external reflux;

means for establishing a second signal representative of the actual flow rate of said external reflux;

computer means for comparing said second signal to the current value of said first signal, wherein an updated first signal which is equal to the current value of said first signal is established if the current value of said first signal is equal to the value of said second signal;

computer means for enabling the establishment of a third signal representative of the actual flow rate of the internal reflux in an upper portion of said fractional distillation column means;

means for establishing a fourth signal representative of a high limit on the actual flow rate of said internal reflux;

computer means for comparing said third signal and said fourth signal, wherein an incremental value is added to the current value of said first signal to establish an updated first signal if said third signal is greater than said fourth signal and said second signal is not equal to the current value of said first signal;

means for establishing a fifth signal representative of the actual temperature of said external reflux;

means for establishing a sixth signal representative of a high limit on the actual temperature of said external reflux; and

computer means for comparing said fifth signal and said sixth signal, wherein an incremental value is subtracted from the current value of said first signal to establish an updated first signal if said fifth signal is greater than said sixth signal, said third signal is not greater than said fourth signal and said second signal is not equal to the current value of said first signal.

4,400,240

COKE OVEN DOOR HAVING OUTER AND INNER SEALING BLADES

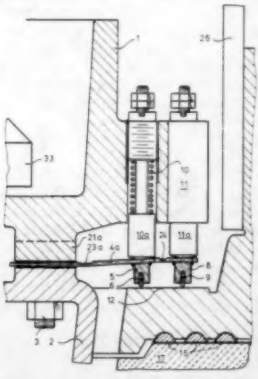
Werner Abendroth, Haltern, Fed. Rep. of Germany, assignor to Firma Carl Still GmbH & Co. KG, Recklinghausen, Fed. Rep. of Germany

Filed Nov. 23, 1981, Ser. No. 324,092

Claims priority, application Fed. Rep. of Germany, Nov. 27, 1980, 3044703

Int. Cl.³ C10B *25/06, 25/16*

U.S. Cl. 202—248 **9 Claims**



1. In a coke oven door for closing an opening to an oven chamber of a coke oven, the door being of the type having a door body, a door stopper mounted to the door body on a side thereof adapted to be adjacent the oven chamber and designed to extend into the oven chamber, the door being for a coke oven having a door frame with a sealing surface bordering the opening, the door having at least one planar sealing diaphragm secured to the door body between the door body and the door

stopper, the diaphragm having sealing blades adapted to extend, along its periphery, inwardly against the sealing surface of the door frame, sealing blades being mounted to the diaphragm about the outer peripheral area thereof, and spring means for urging the sealing blades against the door frame in order to seal the opening, the improvement comprising two sealing blades extended in parallel to each other adapted to be applied against the sealing surface of the door frame, said two sealing blades comprising an outer sealing blade and an inner sealing blade spaced inwardly of said outer sealing blade along the periphery of the diaphragm, elastic means formed in the sealing diaphragm between the door body and said inner sealing blade, and between said two sealing blades for resiliently moving the sealing diaphragm responsive to the spring means so that said two sealing blades can be pressed into contact with the door frame under unequal forces.

4,400,241

EXTRACTIVE DISTILLATION PROCESS FOR THE PRODUCTION OF FUEL GRADE ALCOHOLS

David G. Braithwaite; Thomas Cheavens, and Jason M. Voyce, all of Tyler, Tex., assignors to Improtec, Tyler, Tex.

Filed Jul. 20, 1981, Ser. No. 285,307

Int. Cl.³ B01D *3/40; C07C 29/84*

U.S. Cl. 203—18 **8 Claims**

1. An extraction process for the dehydration of a hydrated aliphatic, monohydric alcohol to produce a fuel grade alcohol which comprises

forming a solvent extractant by dissolving within a low volatility polyhydric alcohol an alkali-metal or alkaline-earth metal salt selected from the group consisting of sodium tetraborate, potassium orthoborate, potassium phosphate, potassium biphosphate, dipotassium phosphate, and a complex salt prepared by adding two moles of an alkali-metal hydroxide to a mole of an alkali-metal tetraborate, said solvent extractant being constituted of from about 2 percent to about 20 percent of said alkali-metal or alkaline-earth metal salt, and from about 80 percent to about 98 percent of said polyhydric alcohol, based on the weight of the total solvent,

contacting and dissolving said solvent extractant within said hydrated aliphatic monohydric alcohol,

distilling said solution of solvent extractant and hydrated aliphatic monohydric alcohol, from about 100 percent to about 800 percent of the extractant solvent being employed to extract and dehydrate said monohydric alcohol, based on the total weight concentration of water contained in said monohydric alcohol, and

condensing and recovering a dehydrated fuel grade aliphatic, monohydric alcohol from said solution.

4,400,242

ELECTROCHEMICAL METHOD OF DETERMINING OXYGEN, HALOTHANE AND NITROUS OXIDE

Wyndham J. Albery, London, and Clive E. W. Hahn, Abingdon, both of England, assignors to National Research Development Corporation, London, England

Continuation-in-part of Ser. No. 190,257, Sep. 24, 1980, abandoned. This application Mar. 5, 1982, Ser. No. 355,139

Claims priority, application United Kingdom, Sep. 24, 1979, 7933007

Int. Cl.³ G01N *27/54*

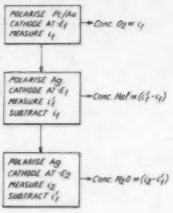
U.S. Cl. 204—1 T **2 Claims**

1. A method of electrochemically sensing the presence of oxygen and nitrous oxide and halothane in a fluid comprises exposing a gold or platinum electrode and a silver electrode to the fluid through permeable means and an electrode-contacting electrolyte through which gases from the fluid can pass,

holding the gold or platinum electrode at a first potential such that oxygen is reduced at that electrode and sensing any first current flowing through the gold or platinum electrode;

holding the silver electrode at said first potential such that oxygen and halothane are reduced at that electrode and sensing any second current flowing through the silver electrode;

subsequently holding the silver electrode at a potential such



that oxygen and halothane and nitrous oxide are reduced at that electrode and sensing any third current flowing through the silver electrode;

and from the three currents determining whether any of the three gases are present.

4,400,243

MONITORING OF HEAVY METAL IONS, ELECTRODE THEREFOR AND METHOD OF MAKING A MEMBRANE SENSITIVE TO HEAVY METAL IONS

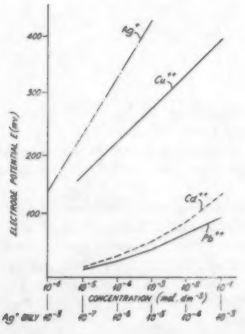
Leslie C. Ebdon, 68 Parkhead Rd., Sheffield S11 9RB, and Brendan P. Hafferty, 5 Gaythorne Ter., Clayton, Bradford, Yorkshire, both of United Kingdom

Continuation of Ser. No. 201,377, Oct. 27, 1980, abandoned. This application Jul. 8, 1982, Ser. No. 396,283

Claims priority, application United Kingdom, Oct. 25, 1979, 7937132

Int. Cl.³ G01N *27/30, 27/46*

U.S. Cl. 204—1 T **16 Claims**



1. A metal sulfide ionic membrane composition, comprising:

a mixture of at least four metal sulfides, said sulfides being 15–65% by weight silver sulfide, 15–65% by weight cadmium sulfide, 30–65% by weight lead sulfide, and 3–9% by weight copper sulfide, such that the membrane is capable of responding electrochemically to all of the corresponding metal ions when said ions are present in solution.

2. A method for the production of the metal sulfide membrane of claim 1, comprising:

mixing at least four of said metal sulfides in said proportions such that the resultant membrane is capable of responding electrochemically to all of the corresponding metal ions when said metal ions are present in solution; and

shaping the mixture into a membrane.

3. The method of claim 2, wherein the sulfides in mixed and

finely divided form are prepared by coprecipitation from solution.

9. An electrode for monitoring metal ions in solution comprising the metal sulfide membrane of claim 1, 2 or 3.

15. A method for monitoring a combination of metal ions present in solution, which comprises:

monitoring the e.m.f. generated in a cell containing the electrode of claim 9.

4,400,244

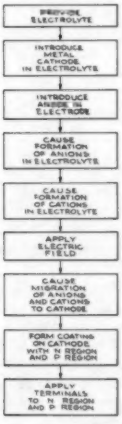
PHOTO-VOLTAIC POWER GENERATING MEANS AND METHODS

Ferdinand A. Kroger, Santa Monica; Robert L. Rod, Marina del Rey, and M. P. Ramachandra Panicker, Camarillo, all of Calif., assignors to Monosolar, Inc., Santa Monica, Calif.

Division of Ser. No. 899,227, Apr. 24, 1978, which is a continuation-in-part of Ser. No. 883,150, Mar. 3, 1978, abandoned, which is a continuation of Ser. No. 693,890, Jun. 8, 1976, abandoned. This application Apr. 8, 1982, Ser. No. 367,723

Int. Cl.³ H01L *31/18*

U.S. Cl. 204—2.1 17 Claims


PROVIDE ELECTROLYTE
INTRODUCE METAL CATHODE IN ELECTROLYTE
INTRODUCE ANODE IN ELECTRODE
CAUSE FORMATION OF ANIONS IN ELECTROLYTE
CAUSE FORMATION OF CATIONS IN ELECTROLYTE
APPLY ELECTRIC FIELD
CAUSE MIGRATION OF ANIONS AND CATIONS TO CATHODE
FORM COATING ON CATHODE WITH N REGION AND P REGION
APPLY TERMINALS TO N REGION AND P REGION

1. A method of preparing a photo-voltaic power generating cell, comprising:

utilizing an electrode as a substrate and having a conductive coating of a semiconductor material of a first conductivity type;

depositing electrochemically on said electrode a coating of at least one semiconductor compound from an electrolytic bath including the components of said semiconductor compound, said at least one semiconductor compound being (a) of the opposite conductivity type, (b) capable of forming a photo-voltaic junction with said conductive coating, (c) transmissive to light radiation, and (d) capable of forming electron-hole pairs upon being irradiated with photons, said components of said at least one semiconductor compound being formed of at least one of the metal elements of Class IIB and at least one of the non-metal elements of Class VIA of the Periodic Table of Elements.

4,400,245

MATRIXING PROCESS FOR THE MANUFACTURE OF MOLDED RECORDS

John J. Prusak, Indianapolis, Ind., assignor to RCA Corporation, New York, N.Y.

Filed Nov. 30, 1981, Ser. No. 325,995

Int. Cl.³ C25D *1/10, 17/12*

U.S. Cl. 204—5 6 Claims

1. In the matrixing process employed in the manufacture of molded records in which a flat matrix having a surface comprised of a flat unrecorded bright metal circumferential outermost zone, an adjacent intermediate recorded zone containing an information track, and an inner unrecorded bright metal zone is electroformed with a metal on said surface to form a

replica thereon: the improvement which comprises: texturizing a circumferential portion of at least one of the unrecorded bright metal zones to provide a circular texturized band of sufficient roughness to prevent premature separation of the replica from the surface of the matrix.

4,400,246

PROCESS FOR APPLYING BARRIER LAYER ANODIC COATINGS

George A. Condas, Castro Valley, and Saad K. Doss, Gilroy, both of Calif., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Jun. 28, 1982, Ser. No. 392,840

Int. Cl.³ C25D *11/04*

U.S. Cl. 204—58 4 Claims

1. A method of providing a barrier layer on the surface of an aluminum substrate comprising the steps of barrier anodizing said substrate at an anodizing current density of at least 20 milliamperes/cm^2 for a very short period of time not to appreciably exceed the barrier formation time, said barrier anodizing being conducted in an acidic bath having a pH of between 5 and 7.

4,400,247

METHOD OF PRODUCING METALS BY CATHODIC DISSOLUTION OF THEIR COMPOUNDS

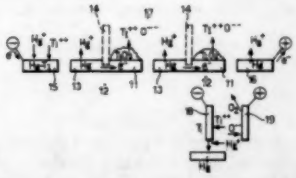
Marco V. Ginatta, Turin, Italy, assignor to Metals Technology & Instrumentation, Inc., Dallas, Tex.

Filed May 7, 1981, Ser. No. 261,336

Claims priority, application Italy, May 7, 1980, 67706 A/80; Apr. 15, 1981, 67519 A/81

Int. Cl.³ C25C *1/00, 1/02, 1/06, 1/12*

U.S. Cl. 204—59 M 24 Claims



1. In a process for producing a metal or metalloid from compounds thereof using an electrolytic cell comprising a terminal anode, a terminal cathode and an electrolyte extending therebetween wherein said compounds are solubilized in said electrolyte by direct current reduction in electron conductive contact with said terminal cathode, the improvement comprising:

(a) providing in said cell between said terminal anode and cathode a plurality of heterogenous bipolar electrodes, each of said heterogenous bipolar electrodes having an anodic portion and a cathodic portion comprised of metal or a mixture of metals;

(b) feeding said compounds of metal or metalloid to said cell into electronic contact with said cathodic portion of said heteronenous bipolar electrodes electrodes while passing electric current through the cell to simultaneously produce direct cathodic reduction of said compounds on said cathodic portions and liberating metal, or metalloid ions, of lower valence than the metal or metalloid of said compounds into said electrolyte from said anodic portions;

(c) circulating said electrolyte in a closed circuit including said bipolar electrodes, said terminal cathode and said terminal anode; and

(d) depositing said liberated ionic metal or metaloid on said terminal cathode.

4,400,248

ELECTROLYTIC STRIPPING PROCESS

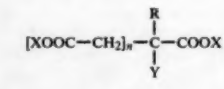
Lillie C. Tomaszewski, Dearborn, Mich., assignor to Occidental Chemical Corporation, Warren, Mich.

Filed Mar. 8, 1982, Ser. No. 355,506

Int. Cl.³ C25F *5/00*

U.S. Cl. 204—146 **14 Claims**

1. A process for electrolytically stripping nickel and nickel-iron alloy deposits from copper and copper alloy basis metals which comprises the steps of immersing an object to be stripped in a stripping bath comprising an aqueous acidic solution consisting of about 5 to about 200 g/l halide salt, about 10 to about 100 g/l of a bath soluble organic carboxy acid, salt and mixtures thereof of the structural formula:



Wherein:

R is H or an alkyl group containing 1 to 4 carbon atoms,

Y is H or OH,

X is H, a Group IA, IIA metal and NH_4,

n is 0, 1 or 2;

and hydrogen ions to provide a pH less than about 5, controlling the temperature of said bath between room temperature up to about 180° F., anodically charging the object and passing electric current through the solution between a cathode and the object for a period of time to achieve the desired magnitude of stripping of the metal deposit from the object.

4,400,249

PARTIAL SYNTHESIS PROCESS FOR PREPARING (+) -VINCAMINE AND RELATED INDOLIC ALKALOIDS

Giovanni Benardelli, Lugano, Switzerland, assignor to Linnea S.A., Lugano, Switzerland

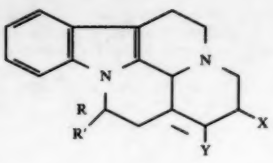
Filed Jun. 10, 1981, Ser. No. 272,383

Claims priority, application Switzerland, Sep. 30, 1980, 7290/80

Int. Cl.³ B01J *19/12*

U.S. Cl. 204—158 R **17 Claims**

1. A process for preparing vincamine and other related indolic alkaloids represented by the general formula (I):



(I)

wherein:

(a) when X=Y=H, R'=—OH, R=—$COOCH_3$, formula (I) represents vincamine,

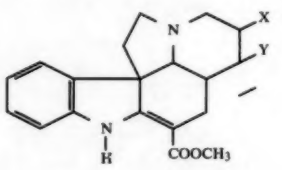
(b) when X=Y=H, R'=—$COOCH_3$, R=—OH, formula (I) represents 16-epivincamine,

(c) when X+Y=a double bond, R'=—OH, R=—$COOCH_3$, formula (I) represents Δ^{14}-vincamine,

(d) when X+Y=a double bond, R'=—$COOCH_3$, R=—OH, formula (I) represents Δ^{14}-16-epivincamine,

comprising the steps of:

a compound of the general formula (II):



(II)

wherein:

(e) when X=Y=H, formula (II) represents vincadifformine, and

(f) when X+Y=a double bond, formula (II) represents tabersonine, is used as a starting substrate;

a reaction medium, comprising a low molecular weight alcohol, a trialkyl phosphite as a reducing agent, and a photosensitizer, is prepared;

said substrate is added to said reaction medium, said trialkyl phosphite being present in a stoichiometrical excess with respect to said substrate;

the thus formed reaction mixture is subjected to gaseous oxygen blowing under substantially ambient temperature and pressure conditions and at the same time said mixture is subjected to irradiation from a light source in order to activate oxygen in situ, for a time not exceeding 150 minutes, to obtain oxidation of said substrate and a resulting reduction;

the treated reaction mixture is acidified, alkalized and extracted;

and finally the extraction residue is subjected to fractional crystallization and/or column chromatography in order to separate distinct products represented by said general formula (I) in the pure state.

4,400,250

ADSORPTION ONTO CHARCOAL CLOTH

David Fairhurst, Tarrytown, N.Y., assignor to The Secretary of State for Defence in Her Britannic Majesty's Government of the United Kingdom of Great Britain and Northern Ireland, London, England

Filed Jul. 21, 1981, Ser. No. 285,521

Claims priority, application United Kingdom, Jul. 24, 1980, 8024280

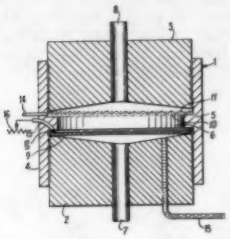
Int. Cl.³ B01D *57/02, 13/02*

U.S. Cl. 204—180 R **12 Claims**

1. A method of adsorbing at least one constituent from an ionically conducting medium which comprises:

a. bringing the medium into contact with a working elec-

trode consisting essentially of charcoal cloth composed of activated fibrous or filamental carbon having a surface area as measured by nitrogen adsorption by the method of Brunnauer/Emmett/Teller, of above 600 m^2 gm^{-1}; and



b. applying a d.c. electric potential to the working electrode with respect to the medium, so that at least one of the constituents is adsorbed on the working electrode.

4,400,251

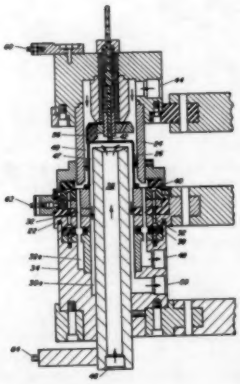
METHOD AND APPARATUS FOR SIMULTANEOUSLY ELECTROCOATING THE INTERIOR AND EXTERIOR OF A METAL CONTAINER

Robert E. Heffner, Lower Burrell, and John J. Davidson, New Kensington, both of Pa., assignors to Aluminum Company of America, Pittsburgh, Pa.

Filed Jun. 5, 1981, Ser. No. 270,612

Int. Cl.³ C25D *13/04, 13/14*

U.S. Cl. 204—181 R **8 Claims**



1. A method of simultaneously electrocoating the interior and exterior of a metal container, which comprises:

(a) enclosing an open-ended metal container within an outer electrically conductive housing in a spaced relation to and generally conforming with the container exterior shape to form a first passageway;

(b) providing an electrically conductive hollow electrode within said metal container and in a spaced relation to the interior surface of the container, the electrode generally conforming to the container interior, to form a second passageway;

(c) providing an electrical contact for electrically charging the metal container through the rim of the open end of the metal container;

(d) electrically insulating each of the hollow electrode, the outer housing and the metal container from one another;

(e) providing a liquid-tight seal between the first passageway and the second passageway to form two separate and unconnected passageways;

(f) flowing electrocoating material into and through the first passageway unidirectionally along the exterior surface of the container sidewall from one end of the container to the other while simultaneously flowing electrocoating material into and through the second passageway unidirectionally along the interior surface of the container sidewall from one end of the container to the other employing separate inlet and outlet ports for each passageway to rapidly flood the passageways and bathe the container exterior and interior with electrocoating material; and

(g) concurrently with the flooding of said passageways, impressing a first electrical potential between the outer housing and the container to electrocoat the exterior of the container while simultaneously impressing a second electrical potential between the hollow electrode and the container to electrocoat the interior of the container.

4,400,252

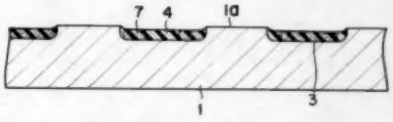
METHOD OF MANUFACTURING METAL DECORATIVE PANEL HAVING COLORED DEPRESSIONS

Hideru Ushijima, Youkaichi, Japan, assignor to Toppan Printing Co., Ltd., Tokyo, Japan

Continuation-in-part of Ser. No. 145,970, May 2, 1980, abandoned, which is a continuation of Ser. No. 22,111, Mar. 20, 1979, abandoned. This application Jul. 13, 1981, Ser. No. 282,648

Int. Cl.³ C25D *13/20, 13/06*

U.S. Cl. 204—181 R **3 Claims**



1. A method of manufacturing a metal decorative panel having colored depressions, which comprises forming a pattern of electrically nonconducting resist layer on a surface of a metal panel, partially exposing the surface of the metal panel; etching the exposed metal surface to a prescribed depth; electrically depositing a synthetic resin layer only on the etched portion of the metal by dipping the patterned metal panel in an aqueous solution containing a paint for electric deposition, the thickness of the deposited synthetic resin layer being thinner than depth of the etched portion; washing off the resist layer by a solvent; pressing a sublimation transfer sheet on the surface of the metal panel under a temperature sufficient to transfer a pattern depicted on the transfer sheet onto the surface portions deposited with the synthetic resin only.

4,400,253

VOLTAGE CONTROL SYSTEM FOR ELECTROSTATIC OIL TREATER

Floyd L. Prestridge, Mounds, Okla.; Adolph A. Schuetz, and Harry L Wheeler, both of Birmingham, Ala., assignors to Combustion Engineering, Inc., Windsor, Conn.

PCT No. PCT/US82/01079, § 371 Date Sep. 30, 1982, § 102(e) Date Sep. 30, 1982

PCT Filed Aug. 9, 1982, Ser. No. 442,209

Int. Cl.³ B01D *17/06;* **C10G** *33/02*

U.S. Cl. 204—186 **18 Claims**

1. In an electrostatic separation process, an automatic voltage control system for coalescing a first fluid which is dispersed throughtout a second fluid by controlling the voltage applied to the primary winding of the step-up transformer, the secondary winding thereof energizes the grid of the electrostatic separation process, comprising:

(a) the step-up transformer having a primary winding and a

secondary winding with the primary winding connected to an alternating current voltage source and the secondary winding connected across the grid of the electrostatic separator;

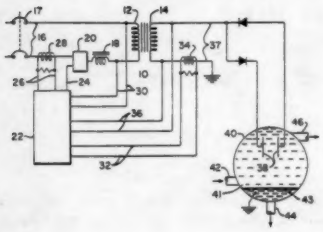
(b) means for measuring the current passing through the primary winding of the step-up transformer;

(c) means for measuring the voltage across the primary winding of the step-up transformer;

(d) a solid state switch in series with the primary winding of the transformer;

(e) means responsive to the current measured by the current measuring means and responsive to the voltage measured by the voltage measuring means for detecting an arcing condition;

(f) means for comparing the current passing through the primary winding as measured by the current measuring means to a predetermined first primary current limit set point, the comparing means having a first input port for receiving the measured primary current from the primary current measuring means, a second input port for receiving the first primary current limit set point and an output port at which the compared current signal is presented;



(g) voltage control circuit means responsive to the compared current signal and responsive to the voltage measured by the voltage measuring means for generating a first control signal to switch the solid state switch on to control the magnitude of the voltage applied to the primary winding of the step-up transformer;

(h) voltage control circuit means for generating a periodic second control signal to switch the solid state switch on to control the magnitude of the voltage applied to the primary winding of the step-up transformer;

(i) circuit means for limiting the magnitude of the first control signal by the magnitude of the second control signal producing a magnitude controlled triggering signal; and

(j) circuit means for applying the magnitude controlled triggering signal to trigger the solid state switch, whereby the voltage applied to the grid and in turn the electric field intensity between grid elements increases then decreases periodically and within the limit of the periodically increasing then decreasing voltage the automatic voltage control system reduces the voltage applied to the grid to zero temporarily upon detecting an arcing condition or a primary current limit has been reached.

4,400,254

METHOD FOR PREPARING TRANSPARENT, ELECTRICALLY CONDUCTING INDIUM OXIDE (IN_2O_3) FILMS

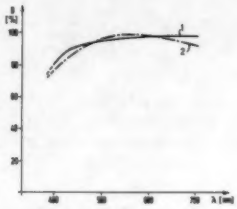
Helmut Freller, Röthenbach, and Peter Schack, Nuremberg, both of Fed. Rep. of Germany, assignors to Siemens Aktiengesellschaft, Berlin & Munich, Fed. Rep. of Germany

Continuation of Ser. No. 168,244, Jul. 10, 1980, abandoned. This application Jan. 18, 1982, Ser. No. 339,865

Claims priority, application Fed. Rep. of Germany, Jul. 26, 1979, 2930373

Int. Cl.³ C23C *15/00*

U.S. Cl. 204—192 P **3 Claims**



1. In a method for preparing transparent, electrically conducting tin-doped indium oxide (In_2O_3) layers on temperature-sensitive substrates through high-frequency cathode sputtering of indium/tin alloy targets in a vacuum, using a reaction gas, the improvement comprising utilizing water vapor having a pressure in the range of from 3×10^{-3} mbar to 5×10^{-3} mbar as the reaction gas, and water-cooling the temperature-sensitive substrates during the deposition.

4,400,255

CONTROL OF ELECTRON BOMBARDMENT OF THE EXHAUST OXYGEN SENSOR DURING ELECTRODE SPUTTERING

Howard D. Kisner, Wichita Falls, Tex., assignor to General Motors Corporation, Detroit, Mich.

Filed Jun. 29, 1981, Ser. No. 278,049

Int. Cl.³ C23C *15/00*

U.S. Cl. 204—192 SP **4 Claims**

1. In a method of sputtering an exhaust electrode onto a given surface of a zirconia solid electrolyte exhaust gas oxygen sensor body, opposite from a surface on said body having a previously formed reference electrode, the improvement of:

providing a low resistance electrical path between the reference electrode and a sputtering anode;

sputtering an exhaust electrode onto said body while it is electrically conductive at a pressure of about 10–20 millitorr, a target-body minimum spacing of at least about 3.0 cm, and at a sputtering power of about 13–22 watts/cm^2 of target area used;

heating said sensor body to make it significantly electrically conductive;

maintaining the exhaust electrode electrically isolated from said reference electrode during said sputtering, so as to maintain a voltage difference between said surfaces during sputtering that enhances sensor rich-to-lean response time; and

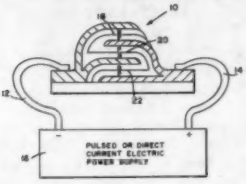
terminating said sputtering of said exhaust electrode onto said given surface before sensor lean voltages and lean-to-rich response times are adversely affected.

4,400,256

METHOD OF MAKING LAYERED SEMICONDUCTOR LASER

Leon H. Riley, 7707 Logan Dr., Huntsville, Ala. 36802

Filed Dec. 18, 1981, Ser. No. 332,263
Int. Cl.³ C23C 15/00
U.S. Cl. 204—192 S 5 Claims



1. A method of making a layered semiconductor laser diode, comprising providing a semiconductor substrate, depositing a first layer of an electrical conductor on a portion of a surface of said semiconductor substrate by sputtering metal onto said semiconductor substrate, sputtering a layer of first semiconductor material over a portion of said first electrical conductor and a portion of said semiconductor substrate, heat treating said sputtered layer of first semiconductor material to improve crystallinity of said first semiconductor material, sputtering a layer of a second semiconductor material of a different type from said first semiconductor material over a portion of said first semiconductor material, heat treating said second semiconductor material to improve crystallinity of said second semiconductor material, and sputtering a second layer of an electrical conductor material over said second semiconductor material to form a laser junction with first and second electrical leads.

4,400,257

METHOD OF FORMING METAL LINES

Gordon C. Taylor, Princeton, N.J., assignor to RCA Corporation, New York, N.Y.

Filed Dec. 21, 1982, Ser. No. 451,818
Int. Cl.³ C23C 15/00
U.S. Cl. 204—192 E 7 Claims

1. A process for forming a conductive line on a substrate, comprising steps of:

forming a conductive layer on the substrate;

forming an apertured masking layer on the conductive layer, the aperture having a first dimension at the surface of the masking layer adjacent the conductive layer and a narrower dimension at its opposite surface;

depositing a line masking layer on the exposed surface of the metal layer;

removing the apertured masking layer;

ion milling the line masking layer and the exposed portions of the conductive layer for a period of time sufficient to form trenches on either side of the line masking layer and to simultaneously redeposit a portion of the line masking material and the conductive layer on the sides of the line masking material to form projecting wings thereon; and

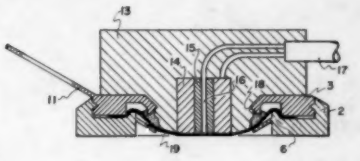
chemically etching the exposed conductive layer and a portion of the conductive layer under the line masking layer.

4,400,258

MEASURING DEVICE FOR FACILITATING THE ELECTRICAL MEASUREMENT OF A SUBSTANCE

Busack Hans-Jürgen; Klaus Kaross, and Helmut Rinne, all of Lübeck, Fed. Rep. of Germany, assignors to Drägerwerk Aktiengesellschaft, Fed. Rep. of Germany

Filed Mar. 16, 1982, Ser. No. 358,529
Claims priority, application Fed. Rep. of Germany, Mar. 21, 1981, 3111190
Int. Cl.³ G01N 27/50
U.S. Cl. 204—415 7 Claims



1. A measuring device for facilitating the electrical measurement of a substance, comprising a holder ring, having an opening, said holder ring having a wall bounding said opening with an inwardly extending annular resilient sealing lip, said holder ring also having an end face with an inner annular projecting portion defining a fitting strip and also having an outer annular projecting portion spaced radially outwardly from said inner annular projecting portion, a membrane engaged over said inner annular projection and the opening of said holder ring, a tightening ring having an end face with an annular groove is positioned over said inner annular projection and including an inner annular counter ring part engageable over said membrane and against said sealing lip and an outer annular tightening ring projecting part disposed between said inner annular projecting portion and said outer annular projecting portion of said holder ring, said groove of said tightening ring defining an electrolyte receiving space overlying said membrane, said inner annular counter ring part and sealing lip defining with said membrane a releasable seal for said electrolyte sealing space.

4,400,259

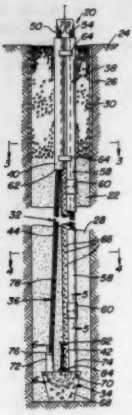
DEEP ANODE ASSEMBLY

William R. Schutt, Doylestown, Pa., assignor to Matcor, Inc., Doylestown, Pa.

Filed Aug. 18, 1981, Ser. No. 293,900
Int. Cl.³ C23F 13/00
U.S. Cl. 204—196 24 Claims

1. An anode assembly for use in a system for cathodically protecting underground metal structures and having a deep bore hole, said bore hole being filled with an electrically conductive material from the bottom of said bore hole to a first point in the bore hole, said anode assembly comprising a weighted bottom assembly arranged for disposition at the bottom of said bore hole, first conduit means extending the depth of said bore hole and connected to said bottom assembly, an electrically conductive longitudinally extending anode located generally outside said first conduit means yet within said bore hole between said bottom assembly and the top of the bore hole and substantially centrally within said bore hole for direct exposure to said electrically conductive material, said anode having an upper end to which a first conductor is connected and a lower end to which a second conductor is connected, said first conductor extending from said upper end of said anode through said bore hole for connection to rectifier means located outside of said bore hole, said second conductor extending through said base assembly and through said first conduit means to the top of said bore hole for connection to

said rectifier means wherein removal and replacement of said anode is readily accomplished by pulling said second conductor through said first conduit means to the outside of said bore hole.



4,400,260

SHIELDED, HEATED ELECTROCHEMICAL GAS SENSOR

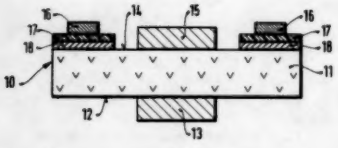
Roland Stahl, Freiberg, and Hans-Martin Wiedenmann, Stuttgart, both of Fed. Rep. of Germany, assignors to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany

Filed Apr. 12, 1982, Ser. No. 367,276

Claims priority, application Fed. Rep. of Germany, May 21, 1981, 3120159

Int. Cl.³ G01N *27/46*

U.S. Cl. 204—426 **4 Claims**



1. Heated electrochemical sensor with internal shielding, to provide an electrical output representative of a predetermined component in a sample gas to which the sensor is exposed, particularly a combustion exhaust gas, especially from an internal combustion engine, having

an oxygen ion conductive solid electrolyte body (**11,25**):

two porous electrode layers (**13, 15; 27, 29**) positioned on the body at spaced surface portions thereof;

a resistance heating element (**16, 30**) on the body. and an electrical supply connection (**22, 35**) and an electrical return connection (**21, 33**) to provide electrical current to the resistance heating element;

and an electrically insulating layer (**17, 31**) separating the resistance heating element from the solid electrolyte ion conductive body and supporting the resistance heating element thereon

wherein, in accordance with the invention

a layer-like shielding electrode (**18, 29**) is provided, positioned between the solid electrolyte body (**11, 25**) and the electrically insulating layer (**17, 31**) on which the resistance heating element is located and supported, and located beneath the resistance heating element.

4,400,261

PROCESS FOR COAL LIQUEFACTION BY SEPARATION OF ENTRAINED GASES FROM SLURRY EXITING STAGED DISSOLVERS

Edwin N. Givens, Bethlehem, and David H. S. Ying, Macungie, both of Pa., assignors to International Coal Refining Company, Allentown, Pa.

Filed Oct. 5, 1981, Ser. No. 308,724

Int. Cl.³ C10G *1/00*

U.S. Cl. 208—8 LE **12 Claims**

1. In a process for the solvent refining of coal wherein a slurry of finely ground coal in process solvent is passed through a preheater to a coal liquefaction stage in the presence of hydrogen-rich gases at elevated temperatures and pressures, the improvement comprising passing the slurry from the preheater in series through a plurality of dissolvers, feeding fresh hydrogen gas to each of said dissolvers, and separating entrained gases from the slurry phase exiting each dissolver and removing said gases from the liquefaction stage, the gas velocity being maintained at a rate to maintain backmix flow in the liquefaction stage so that solids do not settle out therein, and sufficient gas voids being maintained in and sufficient amounts of hydrogen gas being added to said dissolvers so as to insure good hydrogen transfer from the gaseous to the reacting condensed phase.

4,400,262

FLUID COKING WITH THE ADDITION OF POLYMETAPHOSPHORIC ACID CATALYSTS

Roby Bearden, Jr., and Robert C. Schucker, both of Baton Rouge, La., assignors to Exxon Research and Engineering Co., Florham Park, N.J.

Filed May 20, 1982, Ser. No. 380,096

Int. Cl.³ C10G *1/00, 11/18*

U.S. Cl. 208—8 R **11 Claims**

1. In a fluid coking process comprising the steps of: contacting a carbonaceous chargestock with hot fluidized solids in a fluidized bed contained in a coking zone maintained in a fluidized state by the introduction of a fluidizing gas and operated at coking conditions, to produce a vapor phase product and a solid carbonaceous material which deposits on said fluidized solids, the improvement which comprises the presence, in said coking zone, of an effective amount of a phosphorus-containing component selected from the group consisting of polymetaphosphoric acids, salts of polymetaphosphoric acids, precursors of said acids and of said salts, and mixtures thereof.

4,400,263

H-COAL PROCESS AND PLANT DESIGN

Paul H. Kydd, Lawrenceville; Michael C. Chervenak, Pennington, and George R. DeVaux, Princeton, all of N.J., assignors to HRI, Inc., Lawrenceville, N.J.

Filed Feb. 9, 1981, Ser. No. 232,789

Int. Cl.³ C10G *1/06*

U.S. Cl. 208—10 **20 Claims**

1. A process for converting coal and/or other hydrocarbonaceous materials to more valuable liquid products, said process comprising:

(a) feeding coal and/or other hydrocarbonaceous materials with a hydrogen-containing gas into an ebullated catalyst bed reactor;

(b) passing the reaction products from the reactor to a separator where vaporous and distillate products are separated from the residuals of said reacted products;

(c) introducing the vaporous and distillate products directly from the separator to a fixed catalyst bed hydrotreater where said products are further hydrogenated;

(d) passing the residuals from said separator successively through flash vessels at reduced pressures where distillates are flashed off and combined with the vaporous and distillate products to be hydrogenated;

(e) transferring the unseparated residuals to a solids concen-

trating and removal means to remove a substantial portion of solids therefrom and recycling the residual oil to the reactor; and

(f) passing the hydrogenated distillate products from said hydrotreater to a low pressure fractionator where the combined products are fractionated into separate liquid products.

4,400,264

PROCESS FOR THE PREPARATION OF HYDROCARBON OIL DISTILLATES

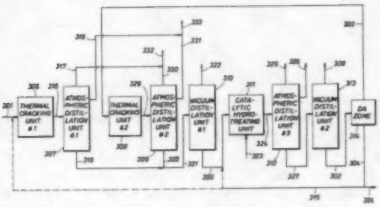
Pieter B. Kwant, and John R. Newsome, both of Amsterdam, Netherlands, assignors to Shell Oil Company, Houston, Tex.

Filed Sep. 30, 1982, Ser. No. 429,778

Claims priority, application Netherlands, Mar. 18, 1982, 8201119

Int. Cl.³ C10G *49/00*

U.S. Cl. 208—68 **9 Claims**



1. A process for the production of hydrocarbon oil distillates from a hydrocarbon mixture feed stream containing asphaltenes, said process comprising:

(a) thermally cracking said feed stream and a deasphalted oil fraction in a thermal cracking zone into a first product stream containing less than 20 percent by weight C_4 to C_1 hydrocarbons;

(b) fractionating said first product stream into one or more light distillate fractions and a first heavy distillate fraction;

(c) catalytically hydrotreating said first heavy distillate fraction in a hydrotreating zone, therein producing a second product stream having a reduced asphaltenes content;

(d) fractionating said second product stream into one or more light distillate fractions and a second heavy distillate fraction;

(e) solvent deasphalting said second heavy distillate fraction in a deasphalting zone to obtain a deasphalted oil fraction and an asphaltic bitumen fraction; and

(f) routing said deasphalted oil fraction from step (e) to said thermal cracking zone.

4,400,265

CASCADE CATALYTIC DEWAXING/HYDRODEWAXING PROCESS

Roderick C. Shen, Belle Mead, N.J., assignor to Mobil Oil Corporation, New York, N.Y.

Filed Apr. 1, 1982, Ser. No. 364,363

Int. Cl.³ C10G *45/58, 45/00*

U.S. Cl. 208—97 **6 Claims**

1. A process for dewaxing and desulfurizing a gas oil which comprises:

(1) passing a gas oil boiling in the 400° to 900° F. range and having a pour point of above about +10° F. and a sulfur content of above about 0.3 weight percent in indirect heat exchange relationship with the dewaxed and desulfurized product recovered in step (23) herein,

(2) passing a first gaseous stream comprising hydrogen in indirect heat exchange relationship with the first vapor phase from step (8) herein,

(3) passing the first gaseous stream comprising hydrogen from step (2) in indirect heat exchange relationship with the dewaxed effluent from step (7) herein,

(4) passing the gas oil from step (1) in indirect heat exchange relationship with the dewaxed effluent from step (3), the heat exchange of steps (3) and (4) being effective to provide, from said dewaxed effluent, a first liquid phase having a boiling range of about 330°–900° F. and a first vapor phase,

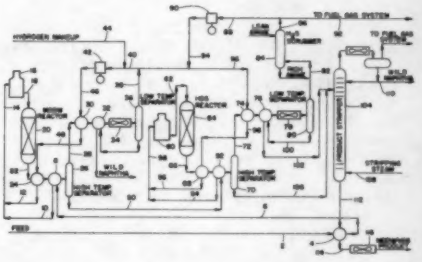
(5) combining the gas oil from step (4) with the first gaseous stream comprising hydrogen from step (3) to provide the first combined streams, said first gaseous stream being provided in an amount to furnish hydrogen effective to hydrodewax said gas oil under the conditions of step (7) herein,

(6) heating the first combined streams from step (5), the heat provided to the gas oil in steps (1) and (4), the first gaseous stream comprising hydrogen in steps (2) and (3) and the first combined streams in step (6) being effective to provide the first combined streams at the hydrodewaxing temperature of step (7) herein,

(7) contacting the first combined streams from step (6) with a ZSM-5 type zeolite catalyst under hydrodewaxing conditions effective to reduce the pour point of said gas oil to between about +10° and −50° F. and provide a dewaxed effluent,

(8) separating the dewaxed effluent from step (4) into a first liquid phase and a first vapor phase,

(9) passing the first vapor phase from step (2) in indirect heat exchange relationship with the second liquid phase from step (11) herein,



(10) cooling the first vapor phase from step (9), the heat exchange of steps (2), (9) and (10) being effective to provide, from the first vapor phase, a second liquid phase having a boiling range of about 100°–630° F. and a second vapor phase,

(11) separating the first vapor phase from step (10) into a second liquid phase and a second vapor phase comprising hydrogen,

(12) recovering the second liquid phase from step (11) as wild naphtha,

(13) passing a second gaseous stream comprising hydrogen in indirect heat exchange relationship with the third vapor phase from step (19) herein,

(14) passing the second gaseous stream comprising hydrogen from step (13) in indirect heat exchange relationship with the desulfurized effluent from step (18) herein,

(15) passing the first liquid phase from step (8) in indirect heat exchange relationship with the desulfurized effluent from step (14), the heat exchange of steps (14) and (15) being effective to provide, from said desulfurized effluent, a third liquid phase having a boiling range of about 330°–900° F. and a third vapor phase,

(16) combining the first liquid phase from step (15) with the second gaseous stream comprising hydrogen from step (14), to provide the second combined streams, said second gaseous stream being provided in an amount to furnish

hydrogen effective to hydrodesulfurize said first liquid phase under the conditions of step (18) herein,

(17) heating the second combined streams from step (16), the heat provided to said first liquid phase in step (15), the second gaseous stream comprising hydrogen in steps (13) and (14) and the second combined streams in step (17) being effective to provide the second combined streams at the hydrosulfurization temperature of step (18) herein,

(18) contacting the second combined streams from step (17) with a hydrosulfurization catalyst under hydrodesulfurizing conditions effective to reduce the sulfur content of the first liquid phase to about 0.05 to about 0.5 wt.% and provide a desulfurized effluent,

(19) separating the desulfurized effluent from step (15) into a third liquid phase and a third vapor phase,

(20) passing the third vapor phase from step (13) in indirect heat exchange with the fourth liquid phase from step (22) herein,

(21) cooling the third vapor phase from step (20), the heat exchange of steps (13), (20) and (21) being effective to provide, from said third vapor phase, a fourth liquid phase having a boiling range of about 100°–650° F. and a fourth vapor phase,

(22) separating the third vapor phase from step (21) into a fourth liquid phase and a fourth vapor phase comprising hydrogen and hydrogen sulfide, and

(23) recovering the third liquid phase as a dewaxed, and desulfurized gas oil product.

4,400,266

METHOD AND APPARATUS FOR SEPARATING SOLID PHASE FROM DRILLING MUD

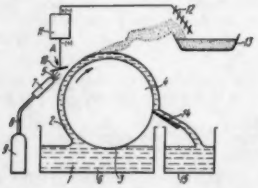
Ulmas D. Mamadzhanov, Ts-1, dom 19, kv. 25; Vitold M. Bakhir, Gaidara, 7"a", kv. 17; Vladimir I. Klimenko, Chilanzar, kvartal 23, dom 3, kv. 37; Stanislav A. Alekhin, Chilanzar, kvartal 24, dom 53, kv. 89, and Jury G. Zadorozhny, Chilanzar, kvartal 2, dom 59, kv. 12, all of, Tashkent, U.S.S.R.

PCT No. PCT/SU80/00054, § 371 Date Nov. 27, 1980, § 102(e) Date Nov. 25, 1980, PCT Pub. No. WO80/02047, PCT Pub. Date Oct. 2, 1980

PCT Filed Mar. 26, 1980, Ser. No. 224,548

Int. Cl.³ B03C *7/00, 7/06*

U.S. Cl. 209—130 **7 Claims**



1. A method for separating solid phase particles from drilling mud, comprising:

forming an adhesive layer of used mud on a rotary closed drum between spaced electrodes, feeding an ionized, pressurized gas jet along a tangent to said adhesive layer at right angles to the radius of said drum to decrease the surface tension of said layer and to entrain said particles and remove them from the mud;

changing the rotary speed of said drum, the amount of said gas fed to said adhesive layer and the polarity of voltage applied to said electrodes to selectively clean said mud; and

physically removing the cleaned adhesive layer from said drum.

4,400,267

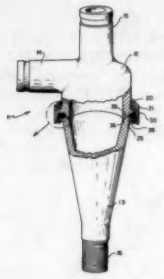
SEAL STRUCTURE FOR HYDROCYCLONES

Donald D. Brose, Park City, Utah, assignor to Baker International Corporation, Salt Lake City, Utah

Filed Aug. 3, 1981, Ser. No. 289,530

Int. Cl.³ B04C *5/14*

U.S. Cl. 209—211 **8 Claims**



1. In a hydrocyclone including a lower cone section and an upper head section, each carrying circumferential elements mutually adapted to be pressed together in sealing relationship by reducing the circumference of external circumferential clamp means, wherein both elements are substantially of resinous material, the improvement which comprises configurating one of said elements as an extension with an external surface shaped as a male taper and an internal surface shaped as a female taper terminating at the interior surface of said hydroclone, and providing the other of said elements with an internal surface adapted to mate with said male taper and an internal structure adapted to mate with said female taper, thereby effecting a double taper seal when the two sections are connected by said external clamp means and the circumference of said clamp means is reduced.

4,400,268

ARRANGEMENT FOR PILING A BULKY MATERIAL HAVING DIFFERENT GRAIN SIZES

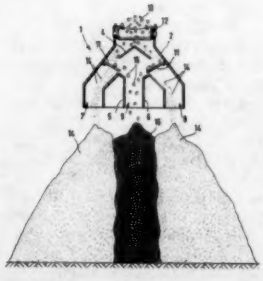
Bernd Stache, and Dieter Vogt, both of Brunswick, Fed. Rep. of Germany, assignors to Bühler-Miag GmbH, Brunswick, Fed. Rep. of Germany

Continuation of Ser. No. 183,832, Sep. 3, 1980, abandoned. This application Mar. 22, 1982, Ser. No. 360,640

Claims priority, application Fed. Rep. of Germany, Sep. 7, 1979, 2936198

Int. Cl.³ B07B *1/04*

U.S. Cl. 209—236 **14 Claims**



2. An arrangement for piling a bulky material which has different grain sizes and is supplied from above downwardly, comprising guiding means arranged to guide a flow of a bulky

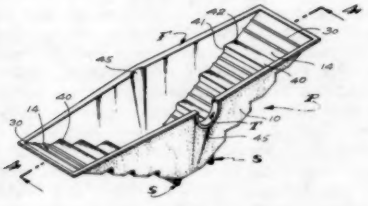
material downwardly; pile forming means including at least three passages with one passage located centrally and two other passages located laterally adjacent to said central passages at opposite sides of the latter; separating means located substantially below said guiding means and above said pile forming means and arranged to separate the flow of the bulky material into at least one coarse grain portion and two fine grain portions, said separating means including grate elements arranged so that the fine grain portions of the bulky material pass through said grate elements into and through a respective one of said lateral passages, whereas the coarse grain portion of the bulky material is guided over said grate elements to pass into and through said central passage so as to form a pile having at least one central pile zone composed of the coarse grain portion of the bulky material, and two lateral pile zones composed of the fine grain portions of the bulky material.

4,400,269

GOLD PAN

Charles O. Gordon, Jr., Montclair, Calif., assignor to Joseph W. Montigny, El Monte, Calif.

Filed May 21, 1981, Ser. No. 265,796
Int. Cl.³ B03B 5/02
U.S. Cl. 209—447 **9 Claims**



1. An elongate, upwardly opening gold pan for use with water to displace lighter waste materials from heavier desired material of a mix of granular materials placed therein comprising:

a normally horizontal, central bottom wall with interior and exterior surfaces, opposite side edges, opposite end edges, and transverse channels, said transverse channels being positioned in said interior surface adjacent said opposite end edges for collecting the heavier desired material;

inclined end walls joined with and extending longitudinally outwardly and upwardly from said end edges of said bottom wall at an angle therebetween, said inclined end walls having side edges, upper outer transverse end edges, and spaced transversely extending, turbulence creating ribs extending therefrom; and

laterally spaced substantially vertical side walls joined with and projecting upwardly from and between said side edges of said bottom wall and said end walls.

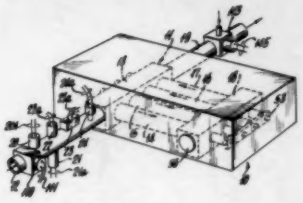
4,400,270

ULTRAVIOLET APPARATUS FOR DISINFECTION AND STERILIZATION OF FLUIDS

Leon Hillman, Demarest, N.J., assignor to ADCO Aerospace, Inc., Closter, N.J.

Division of Ser. No. 141,558, Apr. 18, 1980, Pat. No. 4,336,223. This application Nov. 9, 1981, Ser. No. 319,184
Int. Cl.³ A61L 2/10, 2/16
U.S. Cl. 210—103 **10 Claims**

1. Apparatus for destroying undesirable organisms in a fluid comprising at least one ultraviolet radiation source, a fluid chamber having an inlet and outlet at least partially surrounding said source for guiding said fluid into close proximity to said source to effect penetration of said fluid by said radiation, means at said inlet for measuring physical characteristics of said fluid including flow rate, means for sensing the radiation intensity of said source imparted to said fluid and the radiation intensity emerging from said fluid to determine the radiant energy absorbed by said fluid and means for regulating the



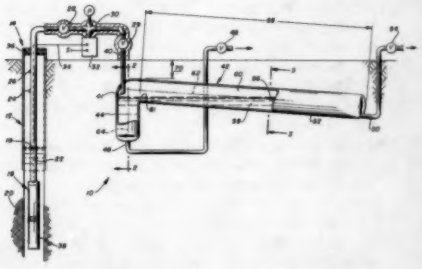
relationship between fluid flow and radiation intensity of said source to impart a selected quantity of radiant energy to said fluid per unit volume thereof, said selected quantity being determined by the measured characteristics of the fluid.

4,400,271

CAPTIVE AIR SYSTEM FOR WATER WELL

Randy L. Lunceford, P.O. Box 9743, Odessa, Tex. 79760

Filed Aug. 11, 1981, Ser. No. 291,902
Int. Cl.³ B01D 21/10
U.S. Cl. 210—136 **4 Claims**



1. In a water well system of the type having a downhole pump supported downhole in a borehole below the water level thereof for supplying water to a storage tank, the improvement comprising:

said storage tank has a vertical leg connected to a lateral leg, said lateral leg is relatively longer than said vertical leg, said lateral leg has an interior end portion connected to an upper interior end portion of said vertical leg and slopes downwardly in a direction away from said vertical leg;

a first pipe for connection from a pump outlet to the interior of the vertical leg of said tank, a supply pipe connected to supply water from the lowermost and outermost interior part of the lateral legs;

and a blow-down pipe connected to the lowermost interior part of the vertical leg for removing debris therefrom;

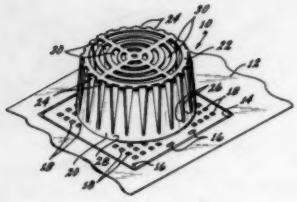
means forming an air space which extends from the top of said vertical leg and across the upper end of said lateral leg, and means forming one liquid space at the bottom of said vertical leg and another liquid space at the bottom of said lateral leg, means by which the recited one and another liquid spaces are joined to one another at the location where the lateral and vertical legs are joined together, when the liquid level is above the said location;

the air space within the tank is maintained at a suitable volume by two spaced check valves placed within said first pipe which enables air to displace a small amount of water each pump cycle.

4,400,272
DRAIN GRATE WITH ADJUSTABLE WEIRS

Duane D. Logsdon, 1708 Calavera Dr., Fullerton, Calif. 92631

Filed Jun. 8, 1981, Ser. No. 271,501
Int. Cl.³ E03F 5/14
U.S. Cl. 210—166 2 Claims



1. In a self supporting foraminous grate for a drain structure an improvement which comprises:

said grate integrally formed as a one piece structure;

a portion of said grate formed as a mounting base, said base sized and shaped to attach to said drain structure maintaining said grate in said drain structure;

a further portion of said grate formed as a generally upwardly projecting wall integrally formed with and extending upwardly from said base, said wall formed as a continuous surface of revolution;

the remaining portion of said grate formed as a top surface integrally formed on the uppermost periphery of said wall, said top surface including a plurality of openings in said top surface;

said grate having an exterior and an interior, said exterior of said grate communicating with the ambient environment, said interior of said grate communicating with said drain structure such that fluid in the interior of said grate passes into said drain structure;

a plurality of weirs located in said wall in a symmetrical array around the surface of revolution of said wall, each of said weirs shaped as an elongated triangle with the base of each of said triangles located proximal to said top surface and the apex of each of said triangles located proximal to said base so as to allow fluid at a first fluid level on said wall proximal to said base to flow at a first rate from the exterior of said grate into the interior of said grate and fluid at a second fluid level on said wall displaced upwardly from said base from said first fluid level to flow at a second rate which is greater than the first rate;

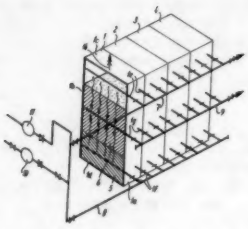
a fluid imperforate area located on said wall and extending between said base and the apex of each of said triangular shaped weirs, said imperforate area forming a dam wall between the exterior of said grate and the interior of said grate inhibiting fluid flow into the interior of said grate;

a member formed as a surface of revolution mimicking the shape of said surface of revolution of said wall and sized to fit around said wall in intimate association with said wall and rotatably movable on said wall about the axis of rotation on said surface of revolution and including a plurality of weirs located in said member in a symmetrical array, each of said plurality of weirs located in said member shaped as an elongated triangle with the base of said triangles located proximal to said top surface of said grate when said member is located around said wall, together one of said triangular weirs in said wall and one of said triangular weirs in said member forming a wedged shaped opening through said member and said wall into the interior of said grate.

4,400,273
PRESSURE FILTER FOR LIQUID, IN PARTICULAR WATER

Dirk Bastenhof, Langerak, Netherlands, assignor to Eco-Pool Design Limited, Great Britain

Filed Oct. 9, 1981, Ser. No. 310,282
Claims priority, application Netherlands, Oct. 9, 1980, 8005591
Int. Cl.³ B01D 25/06
U.S. Cl. 210—284 5 Claims

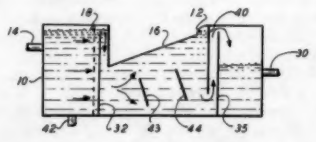


1. A filter for liquid comprising a plurality of substantially equal volume elements arranged side by side and assembled together, each being in the form of a totally closed rectangular parallelepiped pressure tight housing with flat rectangular front, rear, upper and bottom walls and containing filter material, and having a set of inlet tubes connected by header means outside said filter and a set of outlet tubes connected by header means outside said filter, said inlet and outlet tubes extending horizontally through front or rear walls of each element, means connecting the housings of adjacent filter elements to each other, and means reinforcing walls of each element separately against internal outwardly acting pressure from liquid supplied under pressure to the element through said inlet tubes.

4,400,274
SEPARATOR

Bill K. Protos, 151 Spring St., Newton, N.J. 07860

Filed Jun. 25, 1981, Ser. No. 277,146
Int. Cl.³ B01D 17/02
U.S. Cl. 210—302 6 Claims



1. A separator for separating low and high density constituents of a liquid, comprising:

a tank having a liquid inlet, an opposing liquid outlet, a top panel extending across said tank and an upper drain near the upper edge of said panel, said panel being inclined upwardly to cause an upward liquid flow;

an internal baffle having an upstream and downstream side mounted across said tank between said outlet and said panel, said drain opening exclusively on said upstream side of said baffle, said baffle being spaced from the bottom of said tank to produce at said downstream side an upwardly accelerating liquid flow away from said drain;

a filter means affixed adjacent said inlet for filtering its discharging liquid, said tank having between said filter means and said inlet a lower opening;

an input and output dam mounted in said tank, each being spaced from the top of said tank, said outlet being spaced

below the top of said output dam, whereby liquid cascades over said output dam; and

a pair of spaced, upstream baffles mounted in said tank upstream of said internal baffle, said upstream baffles being tilted backwards.

6. A separator according to claim 1 wherein said inlet comprises:

a pair of spaced ports;

an input line; and

a commutating valve for feeding said input line to either one of said ports, said filter means comprising a pair of adjacent catches, each positioned to filter liquid discharging from a different corresponding one of said ports, both of said catches commonly communicating to said drain, said outlet and said internal baffle.

4,400,275

MASS TRANSFER APPARATUS AND PROCESS

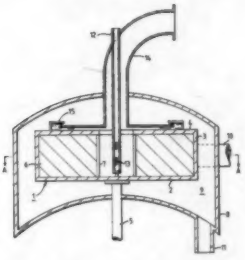
Colin Ramshaw, Norley, and Roger H. Mallinson, Middlesbrough, both of England, assignors to Imperial Chemical Industries PLC, London, England

Filed Nov. 20, 1981, Ser. No. 323,582

Claims priority, application United Kingdom, Dec. 8, 1980, 8039283

Int. Cl.³ B01D *33/06, 3/30*

U.S. Cl. 210—321.1 **6 Claims**



1. In apparatus for effecting mass transfer between two fluid phases, at least the first of which is a liquid, which apparatus comprises an annular permeable element which is rotatable about its axis of symmetry, means to charge the first fluid to the permeable element, means to charge the second fluid to the permeable element and means to discharge at least one of the fluids or a derivative thereof from the permeable element, the improvement wherein at least a part of the radial depth of the permeable element relative to said axis of symmetry is formed by radially overlapping layers of a tape, which tape is of a knitted or woven fabric and has been wound around said axis under a tension which exceeds the stop stress of said tape and secured to maintain said tape under tension.

4,400,276

APPARATUS HAVING TUBE SHEETS FOR HOLLOW FIBERS

Wayne A. Bollinger, Cary, and Roger G. Guay, Apex, both of N.C., assignors to Monsanto Company, St. Louis, Mo.

Division of Ser. No. 86,211, Oct. 18, 1979, Pat. No. 4,265,763.

This application Jan. 28, 1981, Ser. No. 229,229

The portion of the term of this patent subsequent to May 5, 1998, has been disclaimed.

Int. Cl.³ B01D *31/00*

U.S. Cl. 210—323.2 **22 Claims**

1. An apparatus comprising

(a) an elongated tubular shell having at least one open end;

(b) an essentially fluid impermeable end closure cap fastened to and covering said elongated tubular shell at the open end, said end closure cap having at least one fluid communication port;

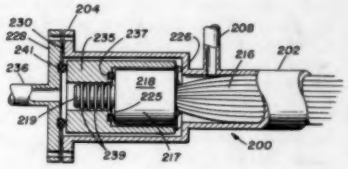
(c) a plurality of tubes which are generally parallel and extended longitudinally to form at least one bundle in the elongated tubular shell;

(d) a rigid, essentially fluid impermeable tube sheet in which the tubes of said at least one bundle are embedded in a fluid tight relationship in the tube sheet such that the lumens of the tubes provide fluid communication through the tube sheet wherein:

(i) the tube sheet has an end face, an opposing bundle face from which said at least one bundle extends into the tubular shell, and a lateral surface extending between said faces,

(ii) the tube sheet has an expanded zone which expanded zone extends a portion of the lateral surface of the tube sheet, and at least one of said end face and said bundle face has at least one smaller cross-sectional dimension than the corresponding cross-sectional dimension of said expanded zone,

(iii) the at least one cross-sectional dimension of the expanded zone is greater than the corresponding cross-



sectional dimension of the remainder of the tube sheet, and

(iv) the tube sheet has at least one rise region on the lateral surface of the tube sheet, which rise region is intermediate the expanded zone and a smaller face, wherein, over the rise region, at least one cross-sectional dimension of the tube sheet increases;

(e) a rigid tubular spacer substantially surrounding the lateral surface of the tube sheet for at least a portion of the distance between the faces and abutting at least one rise region of the tube sheet, wherein said tubular spacer defines an opening adapted to receive said tube sheet for said at least a portion of the distance between the faces and position the tube sheet within the spacer, said opening having a cross-section which is sufficiently large to provide space between the tubular spacer and the tube sheet to accommodate differentials in expansion between the tubular spacer and the tube sheet; and

(f) a sealing means, such that the lumens of the tubes extending to the end face of the tube sheet are in a fluid tight relationship with respect to the exterior of the tubes extending from the bundle face of the tube sheet.

4,400,277

LOW-PROFILE INLINE FILTER

Hayden Leason, Palmas del Mar, P.R., assignor to Filtertek, Inc., Hebron, Ill.

Filed Jun. 25, 1981, Ser. No. 277,323

Int. Cl.³ B01D *27/00*

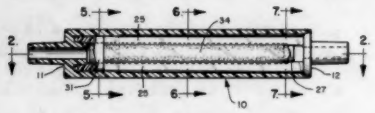
U.S. Cl. 210—441 **6 Claims**

1. An improved low-profile inline filter, for IV sets and the like, consisting of:

a tubular shell unit having a hollow, substantially cylindrical portion open at one end and terminating at the other end in an elongated portion restricted in diameter defining a fluid passageway therethrough and forming an adaptor for connecting the shell unit to a tube, the restricted end portion extending in part into the cylindrical portion to

form therein a donut-shaped seat portion laterally spaced from the inner wall of the cylindrical portion; and

an elongated screen unit having a disc-shaped cap portion at one end, a ring member at the other end, and a plurality of integral ribs extending therebetween, the cap portion having an elongated portion restricted in diameter extending from the cap portion and forming an adaptor for connecting the screen unit to a tube, the cap portion and the restricted end portion defining a fluid passageway therethrough, the ribs being spaced apart from each other and positioned substantially symmetrically around the fluid passageway opening in the cap portion, a filter membrane mounted in between the ribs to define a tubular passageway extending longitudinally between the ribs, and an integral plug member positioned between the end of the ribs adjacent the cap portion to close the end of the tubular passageway near the cap portion, the plug member being longitudinally spaced from the cap portion to define a fluid passageway between the plug member and the cap portion;



the screen unit being adapted to fit substantially within the shell unit such that the ring member of the screen unit seats over and engages the seat portion of the shell unit and the cap portion of the screen unit seats upon the open end of the shell unit to close it.

4,400,278

COUNTER-CURRENT ADSORPTION FILTERS FOR THE TREATMENT OF LIQUIDS AND A METHOD OF OPERATING THE FILTER

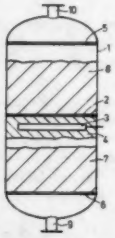
Friedrich Martinola, Cologne, Fed. Rep. of Germany, assignor to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Filed Oct. 1, 1981, Ser. No. 309,614

Claims priority, application Fed. Rep. of Germany, Oct. 29, 1980, 3040616

Int. Cl.³ C02F *1/42*

U.S. Cl. 210—678 **8 Claims**



7. A method of operating a counter-current adsorption filter column or an ion exchange column wherein

(a) different adsorbents or ion exchangers are in a corresponding number of different chambers in the column defined by horizontal subdivisions;

(b) adsorbents or ion exchangers which are regenerated with different regenerating agents are present in adjacent chambers;

(c) the chambers—with the exception of the topmost chamber of the column—are equipped with a liquid drainage system which is located below the device which is permeable to liquid and forms the upper boundary of the chamber, and which is embedded in a layer of inert material; and

(d) the amount of adsorbent or ion exchanger (in % by volume) in the individual chambers is 50 to 98% of the free volume of the chamber,

the method comprising

(i) in the loading phase passing a stream of liquid to be treated from the bottom upwards through the chambers, and

(ii) in the regenerating phase, chamber by chamber introducing a regenerating agent and wash water into the top of each chamber to be regenerated, and removing the spent regenerating agent and washing water through the liquid drainage system of the chamber below simultaneously with a stream of water which flows in counter-current to the stream of the spent regenerating agent and washing water and which is being passed from the bottom upwards through this very chamber below.

4,400,279

PROCESS AND EQUIPMENT FOR RENDERING VISIBLE THE CHARGE OF ION EXCHANGERS

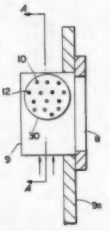
Klaus Wahl, Markdorf, and Klaus Purps, Hagnau, both of Fed. Rep. of Germany, assignors to Dornier System GmbH, Fed. Rep. of Germany

Filed Sep. 26, 1979, Ser. No. 79,046

Claims priority, application Fed. Rep. of Germany, Oct. 7, 1978, 2843882

Int. Cl.³ B01J *47/00*

U.S. Cl. 210—679 **2 Claims**



2. A process for rendering visible a specific metal charge of an ion exchanger which comprises charging resin particles in admixture with inert particles in a liquid, said resin particles being lighter in weight than said inert particles prior to charging and heavier in weight than said inert particles after charging.

4,400,280

METHOD AND APPARATUS FOR SUPPLYING DISTRIBUTING COMPOSITE LIQUIDS TO A LAMINAR SEPARATION APPARATUS

Hans F. Larsson, Västerhaninge, and Sven Hakansson, Nynäshamn, both of Sweden, assignors to Axel Johnson Engineering, AB, Nynaeshamn, Sweden

Continuation of Ser. No. 206,557, Nov. 13, 1980, abandoned. This application Feb. 3, 1982, Ser. No. 345,394

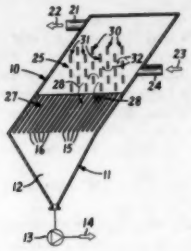
Claims priority, application Sweden, Nov. 20, 1979, 7909609

Int. Cl.³ B01D *21/24*

U.S. Cl. 210—802 **12 Claims**

11. In a method for subjecting an influent composite liquid to separation in laminar separation apparatus comprising a plurality of parallel plates inclined with respect to a horizontal plane and forming a plurality of separation passages therebetween and distributor means communicating with said separation passages for distributing thereto a stream of influent composite liquid received by the distributor means, the distributor means including a fluid flow path in which the direction of flow of

composite liquid is changed at least twice, the improvement comprising decelerating the motion of the stream of influent composite liquid received into the distributor means prior to any change in the direction thereof by subjecting said stream as



it passes in the direction of flow in which it is received into the distributor means to a plurality of deflections in said distributor means to dissipate the kinetic energy thereof, thereby causing the composite liquid to pass from the distributor means uniformly to the plurality of separation passages.

4,400,281

YARN PROCESSING LUBRICANTS

David C. Dehm, Thornton, Pa., assignor to Atlantic Richfield Co., Los Angeles, Calif.

Filed Aug. 19, 1981, Ser. No. 294,110
Int. Cl.³ D06M *15/26, 13/02, 13/20*
U.S. Cl. 252—8.6 **16 Claims**

1. A methood of improving the adhesive and cohesive properties of a textile lubricating composition comprised of a base oil selected from the group consisting of mineral oil, fatty esters and natural oils and an emulsifing agent comprising incorporating into the lubricant formulation about 0.01 to 10%, based on the total weight of lubricating composition, of a polymer selected from (a) homopolymers of normal alpha-monoolefins having 6 to 14 carbon atoms and (b) copolymers of two or more normal alpha-monoolefins having 4 to 20 carbon atoms, said polymer having a weight average molecular weight of about 1 to 10 million.

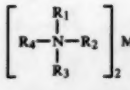
4,400,282

LUBRICATING OILS CONTAINING QUATERNARY AMMONIUM THIOMOLYBDATES

Gary M. Singerman, Monroeville; Yumi P. Ryu, Murrysville, and James R. Anglin, Gibsonia, all of Pa., assignors to Gulf Research & Development Company, Pittsburgh, Pa.

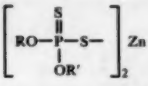
Continuation-in-part of Ser. No. 213,676, Dec. 5, 1980, Pat. No. 4,343,747, and Ser. No. 214,972, Dec. 10, 1980, Pat. No. 4,343,746. This application Dec. 15, 1980, Ser. No. 216,140
Int. Cl.³ C10M *1/48*
U.S. Cl. 252—32.7 E **12 Claims**

1. A lubricating oil composition comprising a major portion of a hydrocarbon lubricating oil comprising in solution (a) at least a friction reducing amount of a tetrahydrocarbylammonium thiomolybdate having the formula



wherein R_1, R_2 and R_3 are independently selected from straight and branched alkyl and alkenyl having from one to about 30 carbon atoms, R_4 is straight or branched alkyl or alkenyl having from about 12 to about 30 carbon atoms and the total number of carbon atoms in R_1, R_2, R_3 and R_4 is between about 19 and about 80 carbon atoms, and (b) a sufficient amount of (1) a zinc dialkyl dithiophosphate and (2) an ashless dispersant to solubilize said tetrahydrocarbylammonium thiomolybdate in the hydrocarbon lubricating oil.

10. A lubricating oil composition in accordance with claim 1 wherein said zinc dialkyl dithiophosphate has the formula



wherein R and R′ are independently selected from hydrocarbyl radicals having from 1 to about 18 carbon atoms.

4,400,283

MULTIFUNCTIONAL LUBRICANT ADDITIVES AND COMPOSITIONS THEREOF

Andrew G. Horodysky, Cherry Hill, and Joan M. Kaminski, Mullica Hill, both of N.J., assignors to Mobil Oil Corporation, New York, N.Y.

Filed Jun. 20, 1981, Ser. No. 294,590
Int. Cl.³ C10M *1/48*
U.S. Cl. 252—32.7 E **19 Claims**

1. A lubricant composition comprising a major proportion of an oil of lubricating viscosity or a grease or other solid lubricant prepared therefrom, and a friction reducing or antioxidant amount of a metal salt of a partially phosphosulfurized polyol based hydroxyl-containing ester, said ester being prepared by reacting a monocarboxylic acid having 4 to 30 carbon atoms with a polyol having the formula

$$RC\{(CH_2)_xOH\}_3 \text{ or}$$
$$\{HO(CH_2)_x\}_3C(CH_2)_xO(CH_2)_xC\{(CH_2)_xOH\}_3$$

wherein R is hydrogen, a $(CH_2)_xOH$ group or a hydrocarbyl group, containing up to 8 carbon atoms and x is 1 to 4, the polyol having from about 5% to about 95% of its hydroxyls phosphosulfurized.

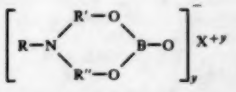
4,400,284

BORON DERIVATIVES AS LUBRICANT ADDITIVES

Peter Jessup, Santa Ana; Richard A. Holstedt, Whittier, and Kenneth Baron, Diamond Bar, all of Calif., assignors to Union Oil Company of California, Los Angeles, Calif.

Filed Jun. 12, 1980, Ser. No. 158,828
Int. Cl.³ C10M *3/48*; C07F *5/04*
U.S. Cl. 252—49.6 **16 Claims**

1. An extreme pressure, anti-wear lubricating composition comprising a major amount of a lubricating oil and a minor amount of an extreme pressure, anti-wear additive of the formula:



wherein R is hydrogen, alkyl, cyclic, alicyclic, aryl, alkylaryl or arylalkyl radical having from about 1 to about 24 carbon atoms, R′ and R″ are either straight or branched carbon chain, cyclic or alicyclic radicals having from 2 to about 20 carbon atoms, y is an integer of 1 to 4, and X is either hydrogen or a metal selected from a transition metal having an atomic number between 21 and 30 or a Group IVA metal and mixtures thereof.

4,400,285

WATER-ACTIVATED EXOTHERMIC CHEMICAL DEICING FORMULATIONS

Alan B. Gancy, 265 Robineau Rd., Syracuse, N.Y. 13207

Filed Apr. 12, 1982, Ser. No. 367,728

Int. Cl.³ C09K 3/18

U.S. Cl. 252—70 8 Claims

1. A dry, water-activated exothermic chemical formulation containing calcium oxide, or calcined limestone, and a water-soluble acetate salt.

4,400,286

HEAT STORAGE MATERIALS SUITABLE IN PARTICULAR FOR INDOOR AIR COOLING

Peter Schaper, Am Remsufer 8/4, D 7148 Remseck-1, and Oliver Laing, Hofenerweg 37, D 7148 Remseck-2, both of Fed. Rep. of Germany

Filed Jan. 15, 1981, Ser. No. 225,417

Claims priority, application Fed. Rep. of Germany, Jan. 19, 1980, 3001903

Int. Cl.³ C09K 5/06

U.S. Cl. 252—70 1 Claim

1. Storage material for storing latent heat, characterized in that said material contains a mixture of Na_2CrO_4, at least 10 Mol H_2O for every Mol Na_2CrO_4, an amount of $Na_2SO_4.10H_2O$ sufficient to raise the melting temperature of the mixture to a desired level between 19° C. and 31.9° C., and 6.7–33.6% by weight of a paper sludge.

4,400,287

HEAT STORAGE MATERIAL

Hiroshi Kimura, and Junjiro Kai, both of Amagasaki, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Jan. 28, 1982, Ser. No. 343,767

Claims priority, application Japan, Mar. 9, 1981, 56-34075; Nov. 12, 1981, 56-182533; Nov. 30, 1981, 56-194723

Int. Cl.³ C09K 3/18

U.S. Cl. 252—70 18 Claims

1. A heat storage material which comprises $NaCH_3COO.3H_2O$ as a main component and a nucleating agent comprising 95 to 10 wt.% of anhydrous sodium acetate and 5 to 90 wt.% of at least one other sodium salt selected from the group consisting of Na_3PO_4, Na_2HPO_4, NaH_2PO_4, $NaNH_4HPO_4.4H_2O$, $Na_5P_3O_{10}$, $C_6H_5Na_2.2H_2O$, $NaBO_2.2H_2O$, $Na_2B_4O_7.10H_2O$, $Na_2C_2O_4$, NaBr, NaCl, $CH_2(COONa)_2.H_2O$, $(CHCOONa)_2.H_2O$, $(CH_2COONa)_2.6H_2O$, $HOC(CH_2)_2(COONa)_3.2H_2O$, $CH_3(CH_2)_2COONa$, $CH_3(CH_2)_6COONa$, $HOOCCH(NH_2)(CH_2)_2COONa.H_2O$, sodium oleate, and sodium stearate.

4,400,288

DETERGENT COMPOSITIONS AND PROCESSES OF MAKING THEREOF

Shafiq Dhanani, Whitley Bay; Ronald MacDonald, Alnwick; James S. Clunie, Whitley Bay, and Maxim C. Brooks, Newcastle upon Tyne, all of England, assignors to The Procter & Gamble Company, Cincinnati, Ohio

Filed Jul. 24, 1981, Ser. No. 286,443

Claims priority, application United Kingdom, Jul. 28, 1980, 8024570; May 19, 1981, 8115314

Int. Cl.³ C11D 3/04

U.S. Cl. 252—135 17 Claims

1. A foam-controlled detergent composition comprising from 1.5% to 100% of a mixture of:

(a) alkoxylated nonionic surfactant,

(b) polydimethylsiloxane foam controller dispersed in at least part of the alkoxylated nonionic surfactant, and

(c) siloxane-oxyalkylene copolymer as dispersing agent for the polydimethylsiloxane foam controller,

wherein the weight ratio of alkoxylated nonionic surfactant to polydimethylsiloxane foam controller is in the range from 10:1 to 100:1 and the weight ratio of polydimethylsiloxane foam controller to siloxane-oxyalkylene copolymer is in the range from 2:1 to 20:1.

4,400,289

COMPOSITION AND PROCESS FOR PICKLING AND REMOVING RUST FROM METAL

Joachim Geldner; Josef Rones, and Horst Danzel, all of Frankfurt, Fed. Rep. of Germany, assignors to Occidental Chemical Corporation, Warren, Mich.

Filed Feb. 5, 1982, Ser. No. 346,331

Claims priority, application Fed. Rep. of Germany, Feb. 14, 1981, 3105508

Int. Cl.³ C11D 7/08; C23G 1/08, 1/12; C11D 7/10

U.S. Cl. 252—142 10 Claims

1. A pickling and rust removing composition for cleaning metal surfaces which comprises fluoride ions, a mixture of calcium compounds and tervalent iron and/or aluminum compounds and which has an acidity corresponding to at least 10% by weight of free acid, calculated as 100% HF.

4,400,290

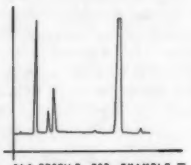
PROCESS FOR AUGMENTING OR ENCHANCING THE AROMA OF DETERGENT COMPOSITIONS USING OXYALKYL ESTERS

Michael Licciardello, Farmingdale; Richard M. Boden, Monmouth Beach; Hugh Watkins, Lincroft, and Marie R. Hanna, Hazlet, all of N.J., assignors to International Flavors & Fragrances Inc., New York, N.Y.

Division of Ser. No. 307,366, Oct. 1, 1981, Pat. No. 4,368,145. This application Jul. 8, 1982, Ser. No. 396,289

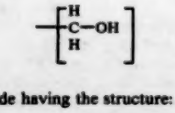
Int. Cl.³ C11D 3/50

U.S. Cl. 252—174.11 5 Claims



GLC PROFILE FOR EXAMPLE I.

1. A process for augmenting or enhancing the aroma of a perfumed article which is a solid or liquid anionic, cationic, nonionic or zwitterionic detergent comprising the step of adding to a solid or liquid anionic, nonionic, cationic or zwitterionic detergent base, an aroma augmenting or enhancing quantity of at least one oxoalkyl ester defined according to the structure:



wherein Z is a moiety selected from the group consisting of carbinol having the structure:

and carboxyaldehyde having the structure:

and R is selected from the group consisting of 3-heptanyl and phenyl.

4,400,291

ETHYLENE GAS GENERATING COMPOSITION

Hugh T. Freebairn, Brenham, Tex., and Tony L. Towns, Prattville, Ala., assignors to Catalytic Generators, Inc., Norfolk, Va.

Filed Jan. 29, 1981, Ser. No. 229,754
Int. Cl.³ C07C 1/00; C09K 3/00
U.S. Cl. 252—188.3 R 11 Claims

1. A liquid composition for the catalytic conversion to ethylene comprising, by volume,

(a) 1.0% to 15% methanol,

(b) 0.1% to 10% of an ester having not more than 10 carbon atoms and formed from a monocarboxylic acid of not greater than 5 carbon atoms,

(c) 0.1% to 15% of a compound selected from the group consisting of an aliphatic alcohol having from 3 to 5 carbon atoms and an aliphatic hydrocarbon having 5 to 9 carbon atoms and

(d) ethanol.

4,400,292

PROCESS FOR MAKING AGENTS FOR DESULFURIZING CRUDE IRON OR STEEL MELTS

Albert Braun, Hürth; Willi Portz; Georg Strauss, both of Erftstadt, and Hans-Martin Delhey, Duisburg, all of Fed. Rep. of Germany, assignors to Hoechst Aktiengesellschaft, Fed. Rep. of Germany

Filed Mar. 18, 1982, Ser. No. 359,229
Claims priority, application Fed. Rep. of Germany, Mar. 24, 1981, 3111509
Int. Cl.³ C01B 31/32; C21C 1/02
U.S. Cl. 252—189 9 Claims

1. A process for the manufacture of desulfurizing agents containing 1–6 weight % chemically combined water, based on calcium oxide and carbon-containing calcium carbide, for crude iron and steel melts, which comprises: producing from lime and coke a molten mixture of calcium carbide and calcium oxide containing 20 to 80 weight % CaO; allowing the mixture to cool and solidify into a block; rough-crushing the solidified block while it still has an average temperature of more than 400° C. to particles with a size of less than 150 mm; admixing the comminuted mixture, which still has a temperature of at least 400° C., with a quantity of calcium oxide necessary to establish in the resulting mixture a total content of CaO corresponding to the CaO content desired in the end product; and then grinding the mixture while intensively mixing it with free carbon and carbonate in the presence of air or nitrogen with a moisture content of 5 to 20 g/m³ (at 1.013 bar and 273.15K) at temperatures below 100° C. to particles with a size of less than 10 mm.

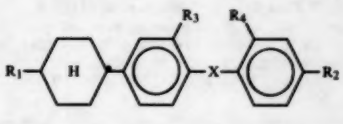
4,400,293

LIQUID CRYSTALLINE CYCLOHEXYLPHENYL DERIVATIVES

Michael Römer, Rodgau; Joachim Krause, Dieburg, and Ludwig Pohl, Darmstadt, all of Fed. Rep. of Germany, assignors to Merck Patent Gesellschaft mit beschränkter Haftung, Darmstadt, Fed. Rep. of Germany

Filed Oct. 29, 1981, Ser. No. 316,382
Claims priority, application Fed. Rep. of Germany, Oct. 29, 1980, 3040632
Int. Cl.³ G02F 1/13; C09K 3/34; C07C 13/28, 25/06, 43/21, 43/225, 121/48, 121/64, 121/75
U.S. Cl. 252—299.63 11 Claims

1. A cyclohexylphenyl of the formula



wherein X is —CH_2—CH_2—, —CH_2—O—, —CH_2—S—, —O—CH_2— or —S—CH_2—; R_1 is alkyl of up to 8 carbon atoms; R_2 is alkyl or alkoxy each of up to 8 carbon atoms, fluorine, chlorine, bromine or cyano; and R_3 and R_4 are both hydrogen or one is hydrogen and the other is fluorine, chlorine, bromine or cyano, with the proviso that R_3 and R_4 are both hydrogen when X is —CH_2—CH_2— or R_2 is fluorine, chlorine, bromine or cyano.

7. A liquid crystalline dielectric for an electro-optical indicator element, comprising at least two liquid crystalline components at least one of which is a cyclohexylphenyl derivative of claim 1.

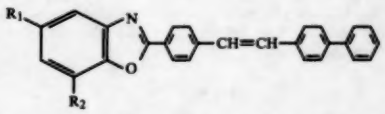
4,400,294

MIXTURES OF OPTICAL BRIGHTENERS

Thomas Martini, and Günter Rösch, both of Bad Soden am Taunus, Fed. Rep. of Germany, assignors to Hoechst Aktiengesellschaft, Fed. Rep. of Germany

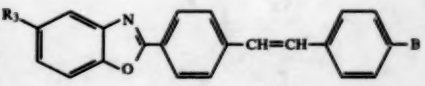
Continuation of Ser. No. 239,650, Mar. 2, 1981, abandoned. This application Nov. 8, 1982, Ser. No. 439,946
Claims priority, application Fed. Rep. of Germany, Mar. 7, 1980, 3008812
Int. Cl.³ C11D 7/26; D06L 3/12
U.S. Cl. 252—301.24 3 Claims

1. Mixtures of optical brighteners consisting essentially of 1 to 99 weight % of a compound of the formula



(1)

and 99 to 1 weight % of a compound of the formula



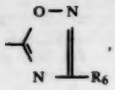
(2)

wherein:

R_1 and R_2 are the same or different and are hydrogen or C_1–C_4 alkyl,

R_3 is hydrogen or C_1–C_9 alkyl, and

B is a group of the formula —$COOR^5$, wherein R^5 is C_1–C_{18} alkyl, or B is



wherein R^6 is C_1–C_6 alkyl.

4,400,295

EMULSIFIER COMPOSITION

Yoshiro Ootsu, Minoo, and Yaeno Arima, Kobe, both of Japan, assignors to Loire Cosmetics Co., Ltd., Tokyo, Japan

Filed Mar. 17, 1980, Ser. No. 130,858

Claims priority, application Japan, Mar. 24, 1979, 54-34961; Mar. 24, 1979, 54-34962; Mar. 24, 1979, 54-34963; Mar. 24, 1979, 54-34964; May 29, 1979, 54-66671

Int. Cl.³ B01F *17/28, 17/34, 17/38, 17/42*

U.S. Cl. 252—356 13 Claims

1. A stable emulsifier composition which comprises an interfacial complex comprising the reaction product of (a) a condensation product of a fatty acid selected from the group consisting of stearic acid, oleic acid, and myristic acid, and a basic amino-acid selected from the group consisting of arginine, lysine, β-lysine, and hydroxylsine, and (b) a secondary compound selected from the group consisting of a sterol compound, a fatty acid ester of a polyhydric alcohol, a diol compound having hydroxyl groups at the α and β positions, a glycerophosphoric acid ester, a higher alcohol and mixtures thereof, said condensation products and said secondary compound being at a weight ratio ranging from 20:1 to 1:20, and said composition being non-irritating to the skin.

4,400,296

CATION-SELECTIVE LIQUID MEMBRANES AND THEIR USE

Hans Batzer, Arlesheim, Switzerland, and Joel Sinnreich, Bensheim, Fed. Rep. of Germany, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

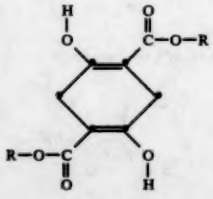
Filed Jun. 18, 1981, Ser. No. 274,962

Claims priority, application Switzerland, Jun. 23, 1980, 4807/80

Int. Cl.³ B01F *1/00*

U.S. Cl. 252—364 3 Claims

1. A liquid membrane for the separation of polyvalent cations from monovalent cations, from aqueous solutions, or for the selective separation of different polyvalent cations from aqueous solutions, which consists of an essentially water-immiscible organic solvent and of an essentially water-insoluble succinosuccinic acid diester, dissolved in the said solvent, of the formula I



(I)

in which R is alkyl having 8 to 24 C atoms or alkenyl having 8 to 24 C atoms, the proportion of the succinosuccinic acid diester in the organic solvent being at least 0.01% by weight, based on the organic solvent, or of the melt of a compound of the formula I.

4,400,297

MODIFIED HYDRATED MAGNESIUM ALUMINOSILICATES AND METHOD OF PREPARATION

Mamerto M. Cruz, Jr., Pennington, N.J., assignor to Morca, Inc., Pennington, N.J.

Filed Oct. 14, 1980, Ser. No. 196,308

Int. Cl.³ C04B *31/02, 31/26;* C09C *3/04, 3/06*

U.S. Cl. 252—378 R 11 Claims

1. The method of producing a modified heat exfoliated hydrated magnesium aluminosilicate in particulate form which comprises treating the heat exfoliated hydrated magnesium aluminosilicate with an aqueous acidic solution having a pH of between about 1.0 and 5.5 while simultaneously subjecting the mass to a controlled shearing action.

7. The method as defined in claim 1, wherein the acidic treatment and shearing action are conducted for from about 2 to about 3 minutes.

4,400,298

WOOD PRESERVATIVE COMPOSITIONS

Denis Boocock, Middlesex, and Barbara M. Kimber, London, both of England, assignors to Borax Holdings Limited, London, England

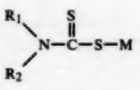
Continuation-in-part of Ser. No. 158,970, Jun. 12, 1980, abandoned, which is a continuation-in-part of Ser. No. 968,834, Dec. 12, 1978, abandoned. This application Aug. 17, 1981, Ser. No. 293,072

Claims priority, application United Kingdom, Dec. 16, 1977, 52415/77

Int. Cl.³ A01N *59/14, 59/02, 37/44, 37/02, 33/08*

U.S. Cl. 252—400 R 21 Claims

1. A wood preservative composition for controlling sapstain and superficial mold comprising as active ingredient a mixture of an alkali metal borate and a dithiocarbamate of the formula:



wherein R_1 and R_2 are each selected from hydrogen and alkyl containing 1 to 5 carbon atoms and M represents an alkali metal, an ammonium group or a lower alkyl substituted ammonium group, in which said alkali metal borate and dithiocarbamate are present in a ratio of 3:1 to 1:3 parts by weight, the alkali metal borate being expressed as anhydrous borax, and about 1 to 5 percent, based on said dithiocarbamate, of a stabilizer selected from sodium sulfite, potassium metabisulfite, and sodium lower alkyl xanthates.

4,400,299

OXIDATIVE RECOVERY OF COBALT OXO CATALYSTS

Linda S. Lagace; Richard C. Miller, and David A. Young, all of Baton Rouge, La., assignors to Exxon Research & Engineering Co., Florham Park, N.J.

Filed Dec. 23, 1981, Ser. No. 333,693

Int. Cl.³ B01J *31/40, 31/20;* C07C *27/22, 45/50*

U.S. Cl. 252—413 16 Claims

1. A process for demetalling an oxo product contaminated with cobalt-containing catalyst residues and recovering cobalt carbonyls therefrom which comprises:

(a) treating the oxo product in a first demetalling zone with a first aqueous solution of a Co^{++} salt of an organic or inorganic acid to extract at least a portion of the cobalt-containing catalyst residues from the oxo product into a first aqueous phase and to form products including said Co^{++} salt and $Co[Co(CO)_4]_2$ therein;

(b) substantially completing the demetalling of the thus treated oxo product by treatment in a second demetalling

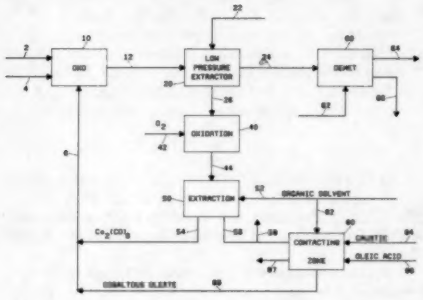
zone with an aqueous organic or inorganic acid in the presence of oxygen to form a Co^{++} salt of said acid;

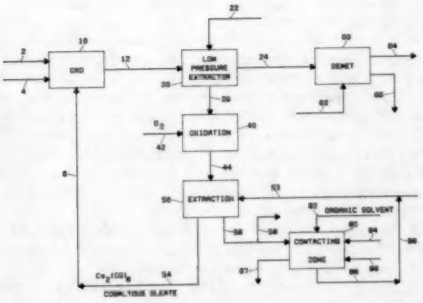
(c) contacting said first aqueous phase in an oxidation zone with molecular oxygen-containing gas at a temperature of from about 0° to 90° C. to form $Co_2(CO)_8$;

(d) contacting the oxidized aqueous mixture of step (c) with an organic solvent at elevated pressure to extract said $Co_2(CO)_8$ and to thereby form an organic extract containing said $Co_2(CO)_8$ and an aqueous raffinate substantially free of $Co_2(CO)_8$ and containing dissolved Co^{++} acid salt values;

(e) passing said organic extract to an oxo reaction zone as catalyst; and

(f) contacting at least a portion of said aqueous raffinate with a higher molecular weight fatty acid, an organic solvent therefor and an alkaline reacting agent to form an organic phase containing the corresponding Co^{++} higher fatty acid salt suitable for recycle to an oxo reaction zone as catalyst.





10. A process for demetalling an oxo product contaminated with cobalt-containing catalyst residues and recovering cobalt carbonyls therefrom which comprises:

(a) treating the oxo product in a first demetalling zone with a first aqueous solution of a Co^{++} salt of an organic or inorganic acid to extract at least a portion of the cobalt-containing catalyst residues from the oxo product into a first aqueous phase and to form products including said Co^{++} salt and $Co[Co(CO)_4]_2$ therein;

(b) substantially completing the demetalling of the thus treated oxo product by treatment in a second demetalling zone with an aqueous organic or inorganic acid in the presence of oxygen to form a Co^{++} salt of said acid;

(c) contacting said first aqueous phase in an oxidation zone with molecular oxygen-containing gas at a temperature of from about 0° to 90° C. to form $Co_2(CO)_8$ in the presence of an organic solvent to extract said $Co_2(CO)_8$ and to thereby form an organic extract containing said $Co_2(CO)_8$ and an aqueous raffinate substantially free of $Co_2(CO)_8$ and containing dissolved Co^{++} acid salt values;

(d) passing said organic extract to an oxo reaction zone as catalyst; and

(e) contacting at least a portion of said aqueous raffinate with a higher molecular weight fatty acid, an organic solvent therefor and an alkaline reacting agent to form an organic phase containing the corresponding Co^{++} higher fatty acid salt suitable for recycle to an oxo reaction zone as catalyst.

15. The process for demetalling an oxo product contaminated with cobalt-containing catalyst residues and recovering cobalt carbonyls therefrom which comprises:

(a) treating the oxo product in a first demetalling zone with a first aqueous solution of a Co^{++} salt of an organic or inorganic acid to extract at least a portion of the cobalt-containing catalyst residues from the oxo product into a first aqueous phase and to form products including said Co^{++} salt and $Co[Co(CO)_4]_2$ therein;

(b) substantially completing the demetalling of the thus treated oxo product by treatment in a second demetalling zone with an aqueous organic or inorganic acid in the presence of oxygen to form a Co^{++} salt of said acid;

(c) contacting said first aqueous phase in an oxidation zone with molecular oxygen-containing gas at a temperature of from about 0° to 90° C. to form $Co_2(CO)_8$; and

(d) contacting the oxidized aqueous mixture of step (c) in a combined extraction/contacting zone with an organic solvent at elevated pressure in the presence of a higher molecular weight fatty acid and an alkaline reacting agent to extract said $Co_2(CO)_8$ into the organic phase and to form the corresponding Co^{++} higher fatty acid salt, thereby forming an organic extract phase containing said extracted $Co_2(CO)_8$ and said Co^{++} higher fatty acid salt suitable for recycle to an oxo reaction zone as catalyst.

16. The process for demetalling an oxo product contaminated with cobalt-containing catalyst residues and recovering cobalt carbonyls therefrom which comprises:

(a) treating the oxo product in a first demetalling zone with a first aqueous solution of a Co^{++} salt of an organic or inorganic acid to extract at least a portion of the cobalt-containing catalyst residues from the oxo product into a first aqueous phase and to form products including said Co^{++} salt and $Co[Co(CO)_4]_2$ therein;

(b) substantially completing the demetalling of the thus treated oxo product by treatment in a second demetalling zone with an aqueous organic or inorganic acid in the presence of oxygen to form a Co^{++} salt of said acid; and

(c) contacting said first aqueous phase in a combined oxidation/contacting zone with molecular oxygen-containing gas at a temperature of from about 0° to 90° C. and in the presence of a higher molecular weight fatty acid, an organic solvent therefor, and an alkaline reacting agent to form an organic phase containing $Co_2(CO)_8$ and Co^{++} higher fatty acid salt corresponding to said higher fatty acid, said organic phase being suitable for recycle to an oxo reaction zone as catalyst.

4,400,300

METHOD FOR RECOVERING AND REACTIVATING COBALT CATALYSTS USED IN THE REACTION OF OLEFINS WITH CARBON MONOXIDE AND ALKANOLS

Wolfgang H. E. Müller, and Peter Hofmann, both of Marl, Fed. Rep. of Germany, assignors to Chemische Werke Hüls AG, Marl, Fed. Rep. of Germany

Filed Apr. 22, 1981, Ser. No. 256,384

Claims priority, application Fed. Rep. of Germany, Apr. 30, 1980, 3016653

Int. Cl.[3] **B01J** *31/40*; **C07C** *67/38*

U.S. Cl. 252—414 **4 Claims**

1. In a process for preparing an alkylester of a saturated aliphatic carboxylic acid by reacting olefin with alkanol in the presence of a catalyst consisting of a cobalt compound and a

promoter selected from the group consisting of pyridine, non-ortho-substituted alkylpyridine, and mixtures thereof to form a reaction mixture, the improvement comprising reactivating and recovering said catalyst by:

(a) treating said reaction mixture with a gas containing oxygen and forming an oxidized cobalt compound;

(b) carrying out a distillation and removing unconverted olefin, uncoverted alkanol, promoter and reaction products and producing a distillation residue containing said oxidized cobalt compound;

(c) mixing an additional portion of said promoter with said distillation residue to form a suspension; and

(d) treating said suspension with a mixture of carbon monoxide and hydrogen at a temperature of about 100° to 250° C. and at a pressure of at least 50 bars, to reactivate said catalyst, and recovering said reactivated catalyst.

2. The process of claim 1, wherein promoter separated by distillation from the reaction mixture is recycled and mixed with said cobalt distillation residue.

3. The process of claim 1, wherein mixtures of carbon monoxide and hydrogen are used, which contain from 10 to 90% by volume of hydrogen.

4,400,301

TRANSITION METAL COMPOUND

John P. Candlin, Aston, Near Stevenage; Anthony D. Caunt, Welwyn Garden City, and Ian G. Williams, Letchworth, all of England, assignors to Imperial Chemical Industries PLC, London, England

Continuation of Ser. No. 688,545, May 21, 1976, Pat. No. 4,111,834. This application Sep. 5, 1978, Ser. No. 939,212

Claims priority, application United Kingdom, May 28, 1975, 23335/75; May 28, 1975, 23336/75

Int. Cl.³ C08F *4/64, 10/00*

U.S. Cl. 252—429 B 14 Claims

1. A process for the production of a transition metal composition which comprises the steps of reacting titanium tetrachloride with a solution, in an inert diluent, of a complex material of the formula $TiAl_2Cl_8$(arene); separating from the reaction mixture a titanium trichloride-aluminium chloride composition, and contacting the titanium trichloride-aluminium chloride composition with at least one organo-Lewis Base compound and titanium tetrachloride by grinding the titanium trichloride-aluminium chloride composition in the presence of the at least one organo-Lewis Base compound and the titanium tetrachloride.

4,400,302

OLEFIN POLYMERIZATION CATALYST COMPOSITIONS AND A PROCESS FOR THE POLYMERIZATION OF OLEFINS EMPLOYING SUCH COMPOSITIONS

Brian L. Goodall; Adrianus A. van der Nat, and Willem Sjardijn, all of Amsterdam, Netherlands, assignors to Shell Oil Company, Houston, Tex.

Filed May 1, 1980, Ser. No. 145,566

Claims priority, application United Kingdom, May 17, 1979, 7917240

Int. Cl.³ C08F *4/64*

U.S. Cl. 252—429 B 32 Claims

14. An olefin polymerization catalyst composition comprising (a) a reaction product of an organoaluminum compound and an electron donor, and (b) a solid component which has been obtained by halogenating a magnesium compound of the formula MgR'R" wherein R' is an alkyl or aryl group and R" is an alkyl or aryl group or halogen, with a halide of tetravalent titanium in the presence of a halohydrocarbon, contacting the halogenated product with a tetravalent titanium compound, and recovering the solid reaction product.

4,400,303

CATALYST FOR OLEFIN POLYMERIZATION

Joel L. Martin, Bartlesville, Okla., assignor to Phillips Petroleum Company, Bartlesville, Okla.

Filed Mar. 9, 1981, Ser. No. 241,975

Int. Cl.³ C08F *4/64*

U.S. Cl. 252—429 B 14 Claims

1. A catalyst for the polymerization of monomers comprising ethylene comprising the product produced by

(1) pretreating solid particles of magnesium dihalide by pulverizing said particles in the presence of at least one oxy compound of the formula

$$RR'C(OR'')_2$$

wherein R is selected from hydrogen, alkyl radicals having 1 to 4 carbon atoms, and halogenated alkyl radicals having 1 to 4 carbon atoms; wherein R' is selected from hydrogen, alkyl radicals containing 1 to 4 carbon atoms, halogenated alkyl radicals containing 1 to 4 carbon atoms, and OR"; wherein each R" is individually selected from alkyl radicals having 1 to 4 carbon atoms; and then

(2) reacting said pretreated solid particles with a halogenated titanium compound of the formula $TiX_n(OR''')_{4-n}$ wherein R''' is a hydrocarbyl radical containing 1 to 12 carbon atoms, X is a halogen, and n is an integer of 1 to 4.

4,400,304

CATALYST PELLETS WITH RESIN BINDER FOR DECOMPOSITION OF HYPOCHLORITE

Roger T. Clark, Pottstown, and David M. Gardner, Collegeville, both of Pa., assignors to Pennwalt Corporation, Philadelphia, Pa.

Continuation-in-part of Ser. No. 81,925, Oct. 4, 1979, abandoned. This application Dec. 15, 1980, Ser. No. 216,042

Claims priority, application Australia, Sep. 16, 1980, 62447/80

Int. Cl.³ B01J *31/28, 31/06;* C08K *3/22;* C02B *1/28*

U.S. Cl. 252—430 3 Claims

1. A porous catalyst matrix in pellet form consisting essentially of a mixture of a powdered oxide or hydroxide of a metal selected from the group consisting of iron, copper, magnesium, nickel and cobalt, and a powdered thermoplastic organic resin comprising polyvinylidene fluoride in a weight ratio of oxide or hydroxide of metal to resin within 1:1 to 15:1, which mixture of powders has been compacted into pellets and then thermally sintered at or about the softening temperature of the resin, thereby forming a porous ctalyst matrix in pellet form which is stable in aqueous hypochlorite solutions.

2. The porous catalyst matrix in pellet form of claim 1 in which the pellet size is about one-eight of an inch in diameter and three-sixteenths of an inch in length.

3. The porous catalyst matrix of claim 1 in which the pellets have been crushed and screened to a particle size of 18 to 35 mesh.

4,400,305

ADSORBENTS COMPRISING HYDRATED FERRITES OF TI, ZR, AND SN AND CURED THERMOSETTING RESINS

Tatsuro Takeuchi, Oumihachiman; Sokukawa Masaki, Takatsuki, and Kimoto Ryuzo, Ibaraki, all of Japan, assignors to Takeda Chemical Industries, Ltd., Japan

Filed Feb. 20, 1981, Ser. No. 236,309

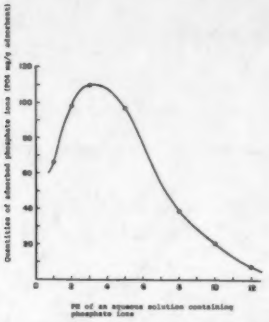
Claims priority, application Japan, Feb. 25, 1980, 55/22952; Sep. 11, 1980, 55/126945

Int. Cl.³ B01J *20/26, 39/18;* C08K *3/22;* B01D *15/04*

U.S. Cl. 252—430 3 Claims

1. An adsorbent, which has been prepared by mixing (a) one part by weight of (i) at least one member selected from the group consisting of hydrated ferrites of titanium, zirconium and tin or (ii) a mixture of the said hydrated ferrites and at least

one member selected from the group consisting of hydrated oxides of titanium, zirconium, tin and iron with (b) about 1/10 to 3 parts by weight of an unsaturated polyester or polyurethane, followed by curing.



2. An adsorbent as claimed in claim 1, wherein the resin content is about 1/5 to 1 part by weight.

3. An adsorbent as claimed in claim 1, wherein the component (ii) is a mixture of hydrated ferrite of zirconium and hydrated oxide of zirconium.

4,400,306

PROCESS FOR THE PREPARATION OF FLUIDIZABLE CATALYSTS

Dennis E. Dria, Cleveland Heights, and Noel J. Bremer, Kent, both of Ohio, assignors to The Standard Oil Company, Cleveland, Ohio

Filed Jun. 28, 1982, Ser. No. 392,961
Int. Cl.³ B01J 31/12, 27/14, 21/02
U.S. Cl. 252—431 R 14 Claims

1. A process for the preparation of a supported catalyst comprising

impregnating a pre-formed catalyst support with a solution of an alkoxide of at least one metal selected from vanadium, molybdenum, antimony, copper, niobium, tantalum, zinc, zirconium, boron and mixtures thereof,

contacting the impregnated support with a solution of at least one additional catalyst component to form the catalyst in situ, and

drying the catalyst-containing support.

4,400,307

PROCESS FOR THE REDUCTION OF THE EFFECT OF CONTAMINANT METALS IN CRACKING CATALYSTS

Fred S. Zrinscak, Woodbury Heights, N.J., assignor to Mobil Oil Corporation, New York, N.Y.

Filed Jun. 18, 1981, Ser. No. 275,001
Int. Cl.³ B01J 29/16, 37/20
U.S. Cl. 252—455 Z 3 Claims

1. A cracking catalyst suitable for cracking hydrocarbons comprising an acidic solid which has incorporated therein antimony or a compound thereof to passivate contaminating metals, said catalyst having been treated with hydrogen sulfide effective to further enhance resistance of the antimony-containing acidic solid to metal contamination.

2. The catalyst of claim 1 wherein said antimony-containing catalyst comprises a crystalline aluminosilicate zeolite.

4,400,308

SILVER-CONTAINING SUPPORTED CATALYSTS AND CATALYST INTERMEDIATE PRODUCTS, PROCESSES FOR THEIR PREPARATION AND THEIR USE

Eduard Alter, Lich; Ludwig Bruns, Dormagen-Straberg, and Werner Volprecht, Fliesteden, all of Fed. Rep. of Germany, assignors to EC Erdolchemie GmbH, Cologne, Fed. Rep. of Germany

Filed Apr. 3, 1981, Ser. No. 250,816
Claims priority, application Fed. Rep. of Germany, Apr. 12, 1980, 3014091
Int. Cl.³ B01J 21/04, 23/50
U.S. Cl. 252—463 28 Claims

1. A supported catalyst containing silver characterized in that:

(a) It has a BET specific surface area of 0.4 to 0.5 square meters per gram;

(b) has a uniform continuous particle structure with spherical silver crystallites thereon which have an average diameter of 0.3 to 0.4 μm.

2. A supported catalyst according to claim 1, containing between 7 and about 30 percent by weight silver.

3. A supported catalyst according to claim 1, wherein said support comprises an alumina support.

5. A supported catalyst according to claim 3, containing 0.05 to 0.5 percent by weight of an alkaline earth metal compound.

6. A supported catalyst according to claim 5, containing 0.07 to 0.3 percent by weight of an alkaline earth metal compound.

4,400,309

PROCESS FOR ACTIVATING A STEAM REFORMING CATALYST AND THE CATALYST PRODUCED BY THE PROCESS

Joseph F. McMahon, Clinton, and Peter Steiner, Edison, both of N.J., assignors to Foster Wheeler Energy Corporation, Livingston, N.J.

Continuation-in-part of Ser. No. 249,208, Mar. 30, 1981, abandoned, which is a continuation of Ser. No. 792,844, May 2, 1977, abandoned, which is a division of Ser. No. 572,797, Apr. 29, 1975, abandoned, which is a continuation of Ser. No. 267,793, Jun. 30, 1972, abandoned. This application Dec. 14, 1981, Ser. No. 330,540
Int. Cl.³ B01J 23/74, 35/02
U.S. Cl. 252—472 6 Claims

1. A process for activation of a catalyst comprising:

treating an elongated twisted nickel strip with a solution of formic acid and hydrogen peroxide to deposit a layer of nickel formate on the strip;

decomposing the nickel formate with a source of heat, such that a decomposition of the nickel formate takes place in which gases are given off, whereby the layer of nickel formate becomes highly activated.

4,400,310

THICK FILM SILVER COMPOSITIONS FOR SILVER TERMINATIONS FOR REDUCED BARIUM TITANATE CAPACITORS

K. Manikantan Nair, East Amherst, N.Y., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Filed Feb. 12, 1980, Ser. No. 120,839
Int. Cl.³ H01B 1/06
U.S. Cl. 252—514 9 Claims

1. A thick film silver composition consisting essentially of a dispersion in an organic vehicle of:

(A) 30–90 parts by weight, based on the weight of the dispersion, of silver powder;

(B) 1–20 parts by weight, based on the weight of the dispersion, of glass having a softening point below 600° C. and an absolute viscosity at the firing temperature of less than 10^6; and

(C) 0.1–30 parts by weight, based on the weight of the dispersion, of inorganic material or precursor thereof con-

taining one or more ions (M', M'' or A) capable of substituting into a $BaTiO_3$ lattice to produce compounds of the type

$$(Ba_{1-x}M_x')\,(Ti_{1-y}M_y'')\,(O_{3-z}A_z),$$

wherein

M' is selected from the group consisting of Ca^{+2}, Ba^{+2}, Sr^{+2}, Pb^{+2}, Rb^{+2}, Cs^{+2} and Fe^{+3};

M'' is selected from the group consisting of Ge^{+4}, Ti^{+4}, Zr^{+4}, Zn^{+2} and Cr^{+3};

A is F^-; and

$x<1$, $y<1$ and $z<0.1$.

4,400,311

SUBSTITUTED METHYL ISOPROPYL CYCLOHEXENONES, ORGANOLEPTIC USES THEREOF AND PROCESS FOR PREPARING SAME

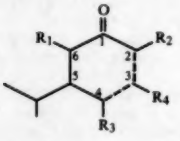
Philip T. Klemarczyk, Old Bridge; Lambert Dekker, Wyckoff, both of N.J., and Jacob Kiwala, Brooklyn, N.Y., assignors to International Flavors & Fragrances Inc., New York, N.Y.

Filed Jan. 28, 1982, Ser. No. 343,580

Int. Cl.³ C11B *9/00*

U.S. Cl. 252—522 R **10 Claims**

1. A process for augmenting or enhancing the aroma or taste of a consumable material selected from the group consisting of perfume compositions, colognes, and perfumed articles, comprising the step of adding to consumable material an aroma augmenting or enhancing quantity of at least one compound defined according to the structure:



wherein one of the dashed lines represents a carbon-carbon double bond and the other of the dashed lines represents a carbon-carbon single bond; wherein R_4 represents methyl or ethyl; wherein one of R_1, R_2 and R_3 represents 2-methyl-1-propenyl or 2-methyl-1-propylidenyl; and the other of R_1, R_2 and R_3 represent hydrogen; with the provisos that:

(i) when the dashed line at the 3–4 position is a double bond, then R_3 is hydrogen or 2-methyl-1-propenyl;

(ii) when the dashed line at the 2–3 position is a double bond, then R_2 is hydrogen or 2-methyl-1-propenyl;

(iii) when R_4 is ethyl, then R_2 is methyl and the double bond is at the 2–3 position; and

(iv) when R_4 is methyl, then R_2 is hydrogen; 2-methyl-1-propenyl or 2-methyl-1-propylidenyl;

with the members of said genus being novel compounds when R_4 is ethyl or when R_4 is methyl and the double bond is at the 3–4 position or when R_4 is methyl and the double bond is at the 2–3 position with R_3 being hydrogen.

4,400,312

SULFUR BASED METAL CLEANERS

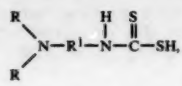
Merlin R. Lindstrom; Rector P. Louthan, and Gary D. Macdonell, all of Bartlesville, Okla., assignors to Phillips Petroleum Company, Bartlesville, Okla.

Filed May 7, 1982, Ser. No. 376,074

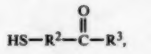
Int. Cl.³ C11D *3/26*

U.S. Cl. 252—545 **19 Claims**

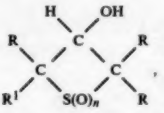
1. A composition suitable as a metallic cleaning agent comprising water and effective amounts of either a Group IA or IIA metal hydroxide and at least one sulfur containing compound selected from the group consisting of a dialkylaminoalkyl dithiocarbamic acid represented by:



and a mercapto alkanone



and a trimethylene ring sulfur compound represented by



wherein R represents any alkyl group having 1 to 3 carbon atoms, R^1 and R^2 represent any alkylene radical having 1–8 and 1–4 carbon atoms each respectively, R^3 represents any alkyl radical having 1 to 6 carbon atoms, and n equals 0, 1, or 2.

4,400,313

PROCESS FOR WASTE ENCAPSULATION

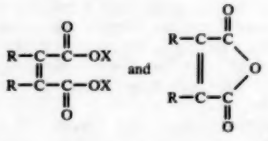
Keith Roberson, Freeland, and Harold E. Filter, Midland, both of Mich., assignors to The Dow Chemical Company, Midland, Mich.

Filed Jun. 30, 1980, Ser. No. 164,424

Int. Cl.³ G21F *9/16*

U.S. Cl. 252—628 **13 Claims**

1. In the process of encapsulating dry solids and aqueous wastes in liquid thermosettable resins of the group consisting of vinyl ester resins, unsaturated polyester resins and mixtures thereof, wherein the waste is dispersed in the resin, the improvement which comprises incorporating in the waste-resin dispersion a water-soluble copolymer of a 1-olefin containing 4 to 16 carbon atoms and a compound selected from the group consisting of



where each R is individually selected from the group consisting of hydrogen, methyl and ethyl and X is individually selected from the group consisting of hydrogen, methyl, ethyl, propyl, butyl, ammonium and an alkali metal, said copolymer being present in an amount sufficient to increase the amount of waste encapsulated in a given amount of resin.

4,400,314

METHOD FOR THE ULTIMATE DISPOSAL OF HIGH LEVEL RADIOACTIVE WASTE

J. R. B. Ellis, Kentfield, and Bernard A. Fries, Orinda, both of Calif., assignors to Chevron Research Company, San Francisco, Calif.

Filed Oct. 14, 1980, Ser. No. 196,954

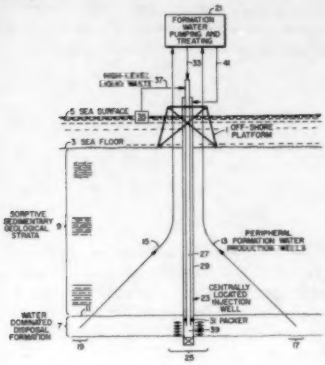
Int. Cl.³ G21F *9/24*

U.S. Cl. 252—633 **6 Claims**

1. A method for disposing of an aqueous solution of radioactive nuclides, comprising:

(a) producing water from a water-containing, porous, gener-

ally horizontally-extending, water-permeable geological formation located below sorptive sedimentary geological strata;



(b) forming a dilute solution of said nuclides by mixing produced water with said aqueous solution; and

(c) injecting said dilute solution into said formation.

4,400,315

METHOD OF REMOVING PHOSPHATE MATERIALS FROM DEPROTEINIZED CHEESE WHEY

Frank A. Thomas, 309 Reese St., Greenwood, Wis. 54437

Filed Jan. 21, 1983, Ser. No. 459,937

Int. Cl.³ A23C *21/00*; A23J *3/00*

U.S. Cl. 260—112 R **5 Claims**

1. A method for removing phosphates from deproteinized cheese whey comprising the steps of adjusting the pH of the deproteinized whey to between 6.4–7.0, subsequently heating the deproteinized whey to a temperature of at least 150° F. but not more than 180° F., subsequently adding calcium hydroxide to the heated deproteinized whey to precipitate phosphates therefrom, the addition of calcium hydroxide being in an amount sufficient to precipitate substantially all phosphates therefrom but in no event should the concentration exceed about 0.1% by weight based on the solids contained in said deproteinized whey, subsequently holding the thus treated deproteinized whey for a holding period lasting at least two hours to allow the material to cool and permit the further precipitation of dicalcium phosphate and removing the dicalcium phosphate precipitate from the deproteinized whey.

4. A method of preparing a deproteinized cheese whey and improving the handling characteristics thereof by removing phosphates therefrom comprising the sequential steps of:

(a) deproteinizing the whey by employing a membrane impervious to the major portion of the protein molecules contained in the whey and employing the process of ultrafiltration and collecting the permeate as deproteinized whey;

(b) adjusting the pH of the permeate to a level of between 6.5–6.7;

(c) heating the deproteinized whey to a temperature of between 160° F. and 180° F.;

(d) adding sufficient calcium hydroxide to the heated deproteinized whey to precipitate substantially all phosphates therefrom as dicalcium phosphate;

(e) holding the material from step (d) for a period of at least two hours to allow the deproteinized whey to cool and to precipitate further dicalcium phosphate therefrom; and,

(f) removing the precipitate from the deproteinized whey.

4,400,316

C-TERMINAL FRAGMENT OF HUMAN CHORIONIC GONADOTROPIN

Shigeo Katsuragi; Kaoru Morita, both of Shizuoka; Sadami Kobari, Mishima; Toshiharu Noda, Shizuoka; Nobuaki Nakagawa, Shizuoka, and Susumu Watanabe, Shizuoka, all of Japan, assignors to Toyo Jozo Kabushiki Kaisha, Shizuoka, Japan

Filed Nov. 12, 1981, Ser. No. 320,699

Claims priority, application Japan, Nov. 11, 1980, 55-158567

Int. Cl.³ C07C *103/52*

U.S. Cl. 260—112.5 R **1 Claim**

1. A peptide of the formula

R-SER-LEU-PRO-SER-PRO-SER-ARG-LEU-PRO-GLY-PRO-SER-ASP-THR-PRO-ILE-LEU-PRO-GLN-OH

wherein

R: H or R_1-Ser-Ser-Ser-Ser-Lys-Ala-Pro-Pro-Pro group,

R_1: H or R_2-R_3-Asp-Asp-Pro-Arg-Phe-Gln-Asp group,

R_2: H or R_4-Asp-His-Pro-Leu-Thr group,

R_4: H-R_5-Gly-Gly-Pro-Lys group,

R_5: Cys or Tyr group, and

R_3: Cys or S-acetamidemethyl-Cys group,

or pharmaceutically acceptable salt thereof.

4,400,317

METHOD OF FORMING COPPER COMPLEXES OF AZO-DYESTUFFS USING NON-SALT-FORMING COPPER (II) COMPOUNDS

Anthony J. Corso, Coventry, R.I., assignor to American Hoechst Corporation, Somerville, N.J.

Filed Jul. 9, 1981, Ser. No. 281,635

Int. Cl.³ C09B *45/08, 45/18, 45/28*

U.S. Cl. 260—151 **4 Claims**

1. A method of directly producing a copperized azo-dyestuff composition of predetermined inert inorganic salt content, wherein the predetermined inert inorganic salt content is within plus or minus 10% of the salt content utilized in a standard strength, commercial composition of said copperized azo-dyestuff, which method comprises reacting

a water soluble ortho, ortho'-dihydroxyazo-dyestuff, or reactive equivalent thereof, which is dissolved in aqueous solution containing inert inorganic salt, said inorganic salt being present in an amount equal to the predetermined amount or less than the predetermined amount by no more than 0.9 moles of salt per mole dyestuff, with

about one molar equivalent of a copper (II) compound consisting of from 1.0 to 0.1 molar equivalent of non-salt-forming copper compound selected from $CuCO_3$.-$Cu(OH)_2$, $2CuCO_3.Cu(OH)_2$, $Cu(OH)_2$, CuO and mixtures thereof, and correspondingly from 0 to 0.9 molar equivalent of a salt-forming copper (II) compound selected from $CuSO_4$, $CuCl_2$ and $Cu(NO_3)_2$ so as not to increase the inorganic salt content of the aqueous solution beyond the predetermined amount, and

drying the solution to obtain a copperized dyestuff/salt composition,

wherein additional, inert inorganic salt is blended with either said dried dyestuff/salt composition or with said aqueous solution of dyestuff and salt prior to drying as needed to increase the total inorganic salt content of the copperized dyestuff composition to the predetermined amount.

4,400,318

SUBSTITUTED 5-ACYL-3-CARBAMOYL-2-THIENYL AZO DYES WITH ANILINE, TETRAHYDROQUINOLINE, AND BENZOMORPHOLINE COUPLERS, PROCESS OF MANUFACTURE, AND POLYAMIDE TESTILE MATERIALS DYED THEREWITH

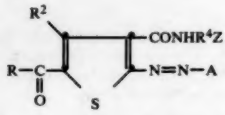
Max A. Weaver, and Clarence A. Coates, Jr., both of Kingsport, Tenn., assignors to Eastman Kodak Company, Rochester, N.Y.

Continuation of Ser. No. 151,077, May 19, 1980, abandoned, which is a continuation of Ser. No. 960,686, Nov. 14, 1978, abandoned. This application Nov. 4, 1981, Ser. No. 318,189

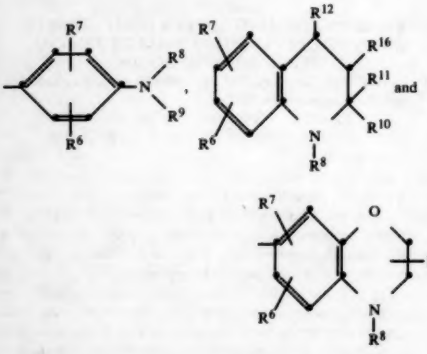
Int. Cl.[3] **C09B** *29/033, 29/09, 29/34, 29/44*

U.S. Cl. 260—152 **10 Claims**

1. A compound of the formula



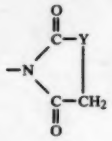
in which R^4 is straight or branched alkylene, Z represents 1–3 groups selected from —OH, alkanoyloxy, alkoxy, alkoxycarbonyl, alkoxy-alkoxy, mono- and dialkylamino, —CN, carbamoyl, alkoxycarbonylamino, alkyl substituted carbamoyl, formamido, alkanoylamino, hydroxy substituted alkoxy, halogen, alkylthio, alkylsulfonyl, furyl, and pyrrolidono; R is selected from straight or branched alkyl, phenyl and phenyl substituted with straight or branched alkyl, halogen, or straight or branched alkoxy; R^2 is hydrogen or alkyl; and A is an azo dye coupler selected from



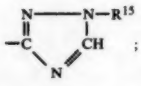
wherein

R^6 and R^7 are each selected from hydrogen, fluorine, chlorine, bromine, alkyl, cycloalkyl, alkoxy, phenoxy, alkylthio, arylthio, and radicals having the formula —NH-X-R^{13} in which X is —CO—, —COO—, or —SO_2— and R^{13} is selected from alkyl and alkyl substituted with halogen, hydroxy, phenoxy, aryl, cyano, cycloalkyl, alkylsulfonyl, alkylthio, alkanoyloxy, and alkoxy, and when X is —CO—, R^{13} also is selected from hydrogen, amino, alkylamino, alkylcarbamoyl, dialkylamino, arylamino, aryl, and furyl;

R^8 and R^9 are selected from hydrogen; cycloalkyl; cycloalkyl substituted with one or two groups selected from alkyl, —OH, alkoxy, halogen, or hydroxy substituted alkyl; phenyl; phenyl substituted with alkyl, alkoxy, halogen, alkanoylamino, cyano or alkoxycarbonyl; straight or branched alkenyl; straight or branched alkyl of 1–8 carbons and such alkyl substituted with the following: hydroxy; halogen; cyano; succinimido; glutarimido; phthalimido; 2-pyrrolidono; cyclohexyl; phenyl; phenyl substituted with alkyl, alkoxy, halogen, alkanoylamino, cyano, or alkoxycabonyl; alkanoylamino; vinylsulfonyl; acrylamido; phthalimidinyl; benzoylsulfonicimidyl; alkylsulfonamido; phenylsulfonamido; alkoxycarbonylamino; alkylcarbamoyloxy; alkoxycarbonyloxy;



wherein Y is —NH—, —NH-lower alkyl—, —O—, —S—, or —CH_2O—; —S-R^{14} wherein R^{14} is alkyl, hydroxyalkyl, phenyl, phenyl substituted with halogen, alkyl, alkoxy, alkanoylamino, cyano, or alkoxycarbonyl, pyridyl, pyrimidinyl, benzoxazolyl, benzimidazolyl, benzothiazolyl, or



—SO_2 substituted with alkenyl, amino, cyclohexylamino, phenylamino, chloroalkylamino, alkyl, chloroalkyl, hydroxyalkyl, cyanoalkyl, cyclohexylalkyl, alkylsulfonylalkyl, alkylthioalkyl, alkanoyloxyalkyl, alkoxyalkyl, aminoalkyl, alkylaminoalkyl, alkylcarbamoylalkyl, dialkylaminoalkyl, phenylaminoalkyl, phenylalkyl, furylalkyl, alkylamino, morpholino, hydroxyalkylamino, or hydroxyalkylalkylamino; —OXR^{13}; —NH-X-R^{13}; —X-R^{13}; —$CONR^{15}R^{15}$; wherein R^{13} and X are as defined above and each R^{15} is selected from H and R^{13}; alkoxy; alkoxy substituted with hydroxy, cyano, alkanoyloxy, or alkoxy; phenoxy; phenoxy substituted with one or more of alkyl, alkoxy or halogen; and R^8 and R^9 representing a single, combined group selected from pentamethylene, ethyleneoxyethylene and ethylenesulfonylethylene, which, with the nitrogen atom to which each is attached, forms a six membered ring;

R^{10}, R^{11} and R^{12} are each selected from hydrogen and alkyl; R^{16} is selected from —OH, —Cl, —$CONH_2$, —CONH-alkyl, alkoxy, phenoxy, —SR^{14}, and —OXR^{13} wherein R^{13} and R^{14} are as defined above; and

wherein each of the above alkyl and alkylene moieties of the various groups where not otherwise specified contain from 1–6 carbons.

4,400,319

MONOAZO PIGMENTS CONTAINING HETEROCYCLES, AND HIGH-MOLECULAR ORGANIC MATERIALS DYED THEREWITH

Stefan Hari, Allschwil, and Arnold Wick, Therwil, both of Switzerland, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

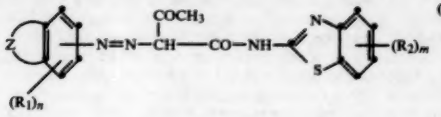
Filed Sep. 24, 1981, Ser. No. 305,305

Claims priority, application Switzerland, Oct. 3, 1980, 7401/80

Int. Cl.[3] **C09B** *29/34, 29/32*

U.S. Cl. 260—155 **10 Claims**

1. A compound of the formula I


(I)

wherein R_1 is hydrogen, methyl, chlorine, methoxy, ethoxy, phenoxy or C_2-C_5-alkoxycarbonyl, R_2 is methyl, chlorine, fluorine, bromine, C_1-C_4-alkoxy, phenoxy, methoxycarbonyl, ethoxycarbonyl, carbamoyl, nitro or a group —NHCO—R_3, in which R_3 is a C_1-C_3-alkyl group, Z together with the two carbon atoms to whih it is bound forms a 5- or 6-membered heterocyclic ring, where Z is a bivalent radical of the formula —CONHCO—, —CONHCONH—, —CONHCR$_5$=N—, —NHCONR$_4$—, —NHCOCONH—, —NR$_4$COO—, —NR$_4$COS—, —N=CR$_6$O—, —N=CR$_6$S—, —N=CR$_6$NH—, —NHCOCH=CR$_4$— or —NHCOCH$_2$O—, in which R_4 is hydrogen, C_1-C_4-alkyl or phenyl which is unsubstituted or substituted by halogen, C_1-C_4-alkyl or C_1-C_4-alkoxy, R_5 is hydrogen or a group

where R_4 has the meaning defined above, and R_6 is hydrogen, methyl or phenyl, n is 1 or 2, and m is 1, 2 or 3.

4,400,320

ALKYLENEOXY FUGITIVE TINTS CONTAINING A 2-AMINO, 6-METHOXY BENZATHIAZOLE GROUP AND PROCESS FOR PREPARING SUCH FUGITIVE TINTS

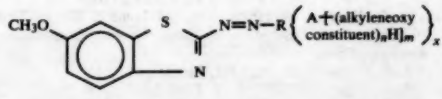
Margaret S. Keller, Inman, and Ralph N. Brendle, Spartanburg, both of S.C., assignors to Milliken Research Corporation, Spartanburg, S.C.

Filed Jul. 13, 1981, Ser. No. 282,456

Int. Cl.³ C09B *29/09, 46/00, 69/00*

U.S. Cl. 260—158 **5 Claims**

1. A compound of the formula:



where R is selected from meta-toluidene, meta-amino phenol, aniline or dimethoxy aniline; A is selected from N, O, S, or CO_2; the alkylene group of the alkyleneoxy constituent contains form 2 to about 4 carbon atoms; n is an integer of from 2 to about 300; m is 1 when A is O, S, or CO_2, and 2 when A is N; x is an integer of from 1 to about 5; and the product of n times m times x (n·m·x) is from 2 to about 400.

4,400,321

PROCESS FOR THE PREPARATION OF SOLUTIONS OF CATIONIC POLYAZO DYESTUFFS

Karl Linhart, Leverkusen; Harald Gleinig, Odenthal-Neschen; Roderich Raue, and Hans-Peter Kühlthau, both of Leverkusen, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

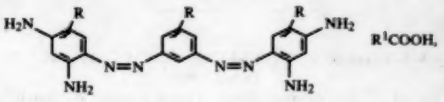
Filed Jun. 17, 1981, Ser. No. 274,338

Claims priority, application Fed. Rep. of Germany, Jul. 5, 1980, 3025557

Int. Cl.³ C09B *31/02*

U.S. Cl. 260—186 **4 Claims**

1. Process for the preparation of concentrated solutions of cationic polyazo dyestuffs of the general formula

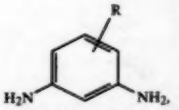


in which

R represents hydrogen or methyl and

R^1 represents an alkyl radical which has 1 to 3 carbon atoms and is optionally substituted by hydroxyl, alkoxy or halogen,

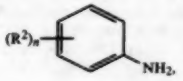
and mixed coupling products thereof with aromatic monoamines, characterised in that diaminobenzenes of the general formula



wherein

R has the abovementioned meaning,

if appropriate mixed with up to 30 mol% of aromatic monoamines of the formula



in which

R^2 represents hydrogen, halogen, C_1- to C_4-alkyl, C_1- to C_4-alkoxy or C_1- to C_4-acylamino and

n denotes a number from 1 to 3,

are dissolved in aliphatic carboxylic acids which have 2 to 4 carbon atoms and can optionally be substituted by halogen, hydroxyl or alkoxy, and are reacted with 0.5 to 0.75 mol of a salt or ester of nitrous acid per mol of diamine at 0° to 30° C.

4,400,322

DISPERSE MONOAZO DYESTUFFS

Peter W. Austin, Bury, and Brian R. Fishwick, Cheadle, both of England, assignors to Imperial Chemical Industries Limited, London, England

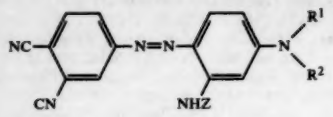
Filed Jun. 15, 1981, Ser. No. 274,288

Claims priority, application United Kingdom, Jul. 4, 1980, 8022054

Int. Cl.³ C09B *29/00*

U.S. Cl. 260—205 **3 Claims**

1. Disperse monoazo dyestuffs having the general formula (I)



(I)

wherein

Z is —COR, —SO_2R or —CO_2R, in which R is optionally substituted alkyl, or optionally substituted aryl,

R^1 is hydrogen, alkyl of 1 to 8 carbon atoms or alkenyl of 3 to 8 carbon atoms, and

R^2 is alkyl of 1 to 8 carbon atoms or alkenyl of 3 to 8 carbon atoms.

4,400,323

3-[1-HYDROXYETHYL]-4-CARBOXYMETHYL-AZETIDIN-2-ONE

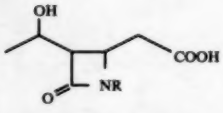
Burton G. Christensen, Scotch Plains; Ronald W. Ratcliffe, Matawan, and Thomas N. Salzmann, North Plainfield, all of N.J., assignors to Merck & Co., Inc., Rahway, N.J.

Continuation of Ser. No. 59,844, Jul. 23, 1979, abandoned. This application Jan. 21, 1981, Ser. No. 226,996

Int. Cl.³ C07D *205/08*; C07F *7/10*; C07D *487/04*; C07F *7/18*

U.S. Cl. 260—239 A **2 Claims**

1. The cis and trans isomers of a compound having the structure:



wherein R is a readily removable blocking group selected from the group consisting of trialkylsilyl wherein the alkyl moieties have 1–6 carbon atoms each.

4,400,324

PROCESS FOR PREPARING ANTHRAQUINONE

Thomas S. Brima, Cincinnati, Ohio, and Auburn B. Cottingham, Lake Elmo, Minn., assignors to National Distillers and Chemical Corporation, New York, N.Y.

Filed Jul. 31, 1981, Ser. No. 288,825

Int. Cl.³ C07C *97/24*

U.S. Cl. 260—369 **9 Claims**

1. A process for preparing anthraquinone which comprises reacting 1,3-butadiene with an oxygen-containing material in the presence of a catalytically effective amount of a catalyst comprising a mixed metal oxide containing aluminum, molybdenum and titanium values.

4,400,325

PROCESS FOR THE PREPARATION OF PURE, SATURATED PERFLUOROALKANE-1-CARBOXYLIC ACIDS FROM 1-IODOPERFLUOROALKANES

Konrad von Werner, and Alfons Gisser, both of Burgkirchen, Fed. Rep. of Germany, assignors to Hoechst Aktiengesellschaft, Fed. Rep. of Germany

Filed Nov. 9, 1981, Ser. No. 319,701

Claims priority, application Fed. Rep. of Germany, Nov. 15, 1980, 3043249

Int. Cl.³ C09F *7/00*; C11C *3/00*

U.S. Cl. 260—408 **7 Claims**

1. In the process for the preparation of pure, saturated perfluoroalkane-1-carboxylic acids having 6 to 14 C atoms from the corresponding 1-iodoperfluoroalkanes, by reacting the 1-iodoperfluoroalkanes with fuming sulfuric acid containing 15 to 45 percent by weight, relative to the solution, of dissolved sulfur trioxide, at temperatures of 100° to 180° C., the molar ratio of sulfur trioxide to 1-iodoperfluoroalkane being 2:1 to 15:1, the resulting two liquid phases being separated from one another when the reaction is complete and the separated lighter liquid phase being distilled, the improvement which comprises mixing, at room temperature or elevated temperature, the lighter liquid phase with 0.3 to 6 percent of its weight of water or with a corresponding amount of an aqueous liquid, and then distilling this mixture at a pressure of 0.1 to 100 kPa, and also mixing the heavier liquid phase, which has been separated off after the reaction with fuming sulfuric acid, with 0.7 to 1.5 moles of water, or with a corresponding amount of an aqueous sulfuric acid, per mole of sulfur trioxide employed, then cooling to 0° to 30° C., filtering off the solid iodine which has been precipitated, washing it with aqueous sulfuric acid and with water.

4,400,326

AQUEOUS METAL AMMINE SILICONATE SOLUTIONS, AND AMORPHOUS MATERIALS DERIVED THEREFROM, AND METHODS OF THEIR USE

William H. Daudt; Cecil L. Frye, both of Midland, Mich., and James F. Hyde, Marco Island, Fla., assignors to Dow Corning Corporation, Midland, Mich.

Filed Sep. 24, 1979, Ser. No. 78,415

Int. Cl.³ C07F *3/06*, *1/10*

U.S. Cl. 260—429 R **10 Claims**

1. Aqueous metal ammine siliconate solutions which comprise the reaction products of

(a) a metal, metal derivative or a mixture thereof which dissolves in the reaction mixture to yield metal ammine cations in the presence of R—NH_2;

(b) R—NH_2 where R is H, aminoalkyls with 2–6 carbon atoms, or mixtures thereof and wherein the —NH_2 molar concentration is equal to at least n times the molar concentration of the metal or metal derivative where n is the coordination number of the metal;

(c) a mono-organosilicon material which can undergo hydrolysis in the presence of the other reactants to yield mono-organosilanols or siloxanols and hydrolysis products which are not more acidic than the silanols or siloxanols wherein the organo moiety in the mono-organosilicon material contains up to about 50 carbon atoms and is selected from the group consisting of saturated and unsaturated hydrocarbons having from 1 to about 6 carbon atoms, halohydrocarbons having up to 6 carbon atoms and wherein the halo substitution is at a location other than the alpha or beta locations, aminohydrocarbons, radicals containing one or more ether or thioether linkages, hydroxyfunctional alkyl radicals, carbomethoxyalkyl radicals, carbamoylalkoxy radicals, quaternary ammonium or phosphonium bearing alkyl radicals and mixtures thereof, the mono-organosilicon material being present in an amount sufficient to yield a silicon/metal ratio of from about 1 to about 10; and

(d) water.

4,400,327

PREPARATION OF SILOXYLATED METAL-CONTAINING CATALYSTS

Feyyaz O, Baskent, Mahopac, N.Y., and James D. Reedy, New Fairfield, Conn., assignors to Union Carbide Corporation, Danbury, Conn.

Filed Dec. 30, 1981, Ser. No. 335,612

Int. Cl.³ C07F *7/22*, *7/24*, *3/10*, *3/06*

U.S. Cl. 260—429 R **9 Claims**

1. A process for preparing a siloxylated organometallic catalyst which comprises reacting below 100° C. a silylamine of the formula:

$$R_{4-n}Si(NR'R'')_n$$

wherein R is a alkyl, alkaryl, alkenyl, alkynyl, aryl cycloali-

phatic, or heteroatom substituted aliphatic siloxy or substituted siloxy group; R′ and R″ are individually hydrogen, alkyl, alkenyl, alkynyl, aryl, cycloaliphatic, or heteroatom substituted aliphatic, groups provided R′ and R″ cannot both be hydrogen; and n is one to four inclusive, with a metallic carboxylate of the formula:

$$M(OCOR''')_xR''''_y$$

wherein M is a metal with an oxidation state, R‴ and R⁗ are individually an alkyl, alkaryl, alkenyl, alkynyl, aryl, cycloaliphatic, or heteroatom substituted aliphatic, group; x is at least one but no more than the oxidation state of M and y is equal to the oxidation state of M minus x, and M is greater than or equal to two.

4,400,328
CRYSTALLINE ALUMINOSILICATE ZEOLITE CATALYST AND THE METHOD FOR MANUFACTURING THEREOF

Yoshinobu Takegami, 5 Shugakuin-Takabe-cho, Sakyo-ku, Kyoto; Tomoyuki Inui, 35-21 Koaza-Shodo, Oaza-Terada, Joyo; Takayuki Ishihara, 3 Shogoin-Nakamachi, Sakyo-ku, Kyoto; Eiichi Araki, 790-5 Kuchiri, Onoe-cho, Kakogawa, and Toshihiro Kanie, 26-14 Oya-cho, Nishinomiya, all of Japan

Filed Oct. 19, 1981, Ser. No. 312,496
Int. Cl.³ C07F 5/06
U.S. Cl. 260—448 C **5 Claims**

1. A crystalline alumino-silicate ZKU-catalyst, comprising: a crystallized composition having the following molar ratios:

SiO_2/Al_2O_3	8–70
OH^-/SiO_2	0.2–1.6
H_2O/SiO_2	10–30
M/SiO_2	0.2–1.7
R/SiO_2	0.0086–0.20
R/R + M	0.0005–0.40
K_2O/M_2O	0.05–0.3

wherein R is a conditioning agent comprising a tetraalkyl ammonium cation, the alkyl moieties of which being the same or different and selected from the group consisting of methyl and ethyl;

wherein M is selected from the group consisting of alkali metal ions; and

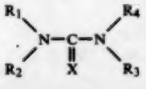
wherein said composition has an X-ray diffraction pattern as shown in Table I of the specification.

4,400,329
PROCESS FOR THE MANUFACTURE OF THIOCHLORFORMATES

Julien Deweerdt, Toulouse; Jacques Sala, Portet sur Garonne, and Denis Souyri, Toulouse, all of France, assignors to Societe Nationale des Poudres et Explosifs, Paris, France

Filed Nov. 27, 1981, Ser. No. 325,369
Claims priority, application France, Dec. 5, 1980, 80 25819
Int. Cl.³ C07C 154/00
U.S. Cl. 260—455 B **8 Claims**

1. Process for the manufacture of thiochloroformates by reacting phosgene with a mercaptan in the presence of a catalyst, wherein a substituted urea or the reaction product of a substituted urea with phosgene is used as the catalyst and the urea has the formula



in which X=O or S and in which R_1, R_2, R_3 and R_4 are linear or branched C_1 to C_{18} alkyl, C_6 to C_9 aryl, C_7 to C_{10} alkaryl, C_7 to C_{10} aralkyl, C_2 to C_5 alkenyl or hydrogen atoms, R_1, R_2, R_3 and R_4 being all different or all the same at least one of R_1, R_2, R_3 and R_4 being other than hydrogen or alternatively R_1 and R_2 are joined to one another to form a polymethylene chain containing from 4 to 8 members, or R_3 and R_4 also forming with one another a polymethylene chain containing from 4 to 8 members.

4,400,330
METHOD FOR PREPARATION OF N-PHOSPHONOMETHYLGLYCINE

Rayman Y. Wong, Richmond, and Nathan S. Bunker, El Cerrito, both of Calif., assignors to Stauffer Chemical Company, Westport, Conn.

Filed Jul. 29, 1982, Ser. No. 403,239
Int. Cl.³ C07F 9/38
U.S. Cl. 260—502.5 F **8 Claims**

1. A method for the production of N-phosphonomethylglycine which comprises the steps of:

(1) first reacting 2,5-diketopiperazine with p-formaldehyde, then adding a substituted phosphorus compound, of the formula PXYZ, wherein X is a halogen, and Y and Z are independently selected from the group consisting of the halogens, all in the presence of a low molecular carboxylic acid solvent, to form an intermediate bis-phosphonomethyl-2,5-diketopiperazine compound,

(2) isolating said intermediate bis-phosphonomethyl-2,5-diketopiperazine compound,

(3) reacting said intermediate bis-phosphonomethyl-2,5-diketopiperazine compound with a hydrolyzing agent selected from an alkali or alkaline earth base to form a salt of N-phosphonomethylglycine, and

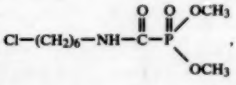
(4) acidifying said salt with a suitable mineral acid to cause formation of the end product, N-phosphonomethylglycine.

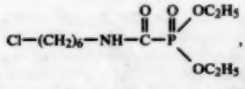
4,400,331
DIALKOXY-PHOSPHONYL-N-ALKYL-FORMIC ACID AMIDES

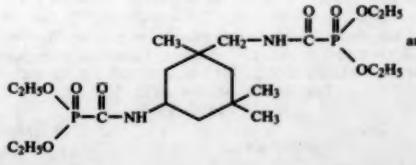
Peter Haas, Haan; Heinz Müller, Leverkusen; Peter Seifert, Bergisch Gladbach; Kuno Wagner, Leverkusen; Kurt Findeisen, Odenthal, and Klaus König, Leverkusen, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Division of Ser. No. 185,870, Sep. 11, 1980, Pat. No. 4,328,321.
This application Jan. 25, 1982, Ser. No. 342,544
Claims priority, application Fed. Rep. of Germany, Sep. 17, 1979, 2937509
Int. Cl.³ C07F 9/40
U.S. Cl. 260—932 **1 Claim**

1. Dialkoxy-phosphonyl-N-alkyl-formic acid amides corresponding to the formulae:







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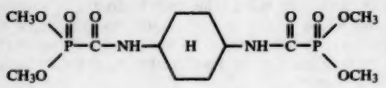


4,400,332

ELECTROSTATIC DISPERSAL OF LIQUIDS

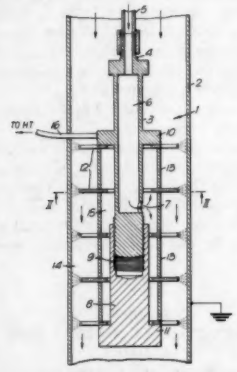
Ian E. Pollard, Grove, and Keith C. Hawkins, Abingdon, both of England, assignors to The Secretary of State for Industry in Her Britannic Majesty's Government of the United Kingdom of Great Britain and Northern Ireland, London, England

Continuation of Ser. No. 149,988, May 15, 1980, abandoned. This application Dec. 7, 1981, Ser. No. 328,131

Claims priority, application United Kingdom, May 22, 1979, 7917791

Int. Cl.³ B01F *3/04*

U.S. Cl. 261—1 19 Claims



1. Apparaus for the dispersal of liquid into a gas stream, comprising:

at least one member formed of inherently porous material and being sufficiently porous that the liquid can soak therethrough and having a plurality of termini;

means for supplying said liquid to said porous member;

means for establishing an electric field in the vicinity of the termini on said porous member, said electric field causing liquid at said termini to be electrostatically dispersed from said termini; and

means for directing a flow of gas past said termini so as to entrain and remove liquid electrostatically dispersed from said termini.

4,400,333

PRODUCTION OF OXYGEN PERMEABLE CONTACT LENSES

Charles W. Neefe, P.O. Box 429, Big Spring, Tex. 79720

Continuation-in-part of Ser. No. 193,704, Oct. 3, 1980, abandoned, which is a continuation-in-part of Ser. No. 171,500, Jul. 23, 1980, abandoned, which is a continuation-in-part of Ser. No. 20,822, Mar. 15, 1979, Pat. No. 4,239,712, which is a continuation-in-part of Ser. No. 972,526, Dec. 22, 1978, Pat. No. 4,202,848, which is a continuation-in-part of Ser. No. 874,934, Feb. 3, 1978, Pat. No. 4,150,073, which is a continuation-in-part of Ser. No. 793,388, May 25, 1977, abandoned. This application Dec. 3, 1981, Ser. No. 327,179

Int. Cl.³ B29D *11/00*

U.S. Cl. 264—2.7 3 Claims

1. A method of correcting refractive errors of the eye by the steps of copolymerizing 1,1,1tris(trimethylsiloxy)methacryloxypropylsilane and methylmethacrylate monomer with the oxygen permeable crosslinker Bis(methacryloxypropyl)tetramethyldisiloxane to form an oxygen permeable transparent solid copolymer, cutting and polishing the surfaces of the transparent permeable crosslinked copolymer to form a correcting lens to be worn on the cornea of the eye.

4,400,334

APPARATUS FOR MAKING HEARTH OF KILN UNDER VIBRATION

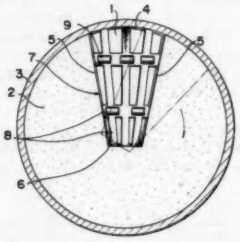
Shigeru Okuda, Bizen; Masashi Mori, Okayama, and Masahiro Hayase, Bizen, all of Japan, assignors to Shinagawa Refractories Co., Ltd., Tokyo, Japan

Division of Ser. No. 149,898, May 15, 1980, abandoned. This application Oct. 15, 1981, Ser. No. 311,767

Claims priority, application Japan, Aug. 22, 1979, 54-114569

Int. Cl.³ F27D *1/16*

U.S. Cl. 264—30 5 Claims



1. A method of compacting a layer of dry particulate refractory material over a lining of refractory bricks on a circular hearth of a kiln having an upstanding peripheral wall, comprising the steps of:

providing vibrating-compacting apparatus comprising a sector-shaped pressurizing plate said plate having a surface area of 0.5 to 5 m^2 and having an arcuate end, and means for vibrating said plate;

providing a layer of dry, compactable particulate refractory material over said lining of refractory bricks on said circular hearth;

positioning said vibrating-compacting apparatus on said layer, the arcuate end of said sector-shaped pressurizing plate having a radius of curvature substantially the same as that of the peripheral wall of said kiln such that the arcuate end of the sector-shaped pressurizing plate can be positioned in adjacency along its length with said peripheral wall, said pressurizing plate being sized to cover only a minor portion of said circular hearth;

actuating said vibrating means to compact the dry particulate refractory material under said pressurizing plate; and

moving said vibrating-compacting apparatus to a new position on said hearth to compact the dry particulate refractory material thereunder to provide a compacted layer of said dry particulate refractory material on said kiln hearth.

4,400,335

PROCESS FOR REPAIRING REFRACTORY LININGS

Lennart P. Ivarsson, Hoganas, and Ingvar G. A. Blom, Nyhamnslage, both of Sweden, assignors to Höganäs AB, Höganäs, Sweden

Filed Dec. 15, 1981, Ser. No. 331,006

Int. Cl.³ F27D *1/16*

U.S. Cl. 264—30 9 Claims

1. In a process for repairing hot refractory linings by applying a refractory composition by spraying onto the site to be repaired, the improvement comprising applying a composition

containing combustible elongated channel-forming elements substantially evenly distributed throughout the composition

wherein the hot refractory has a temperature greater than that at which the channel-forming elements are combustible.

4,400,336

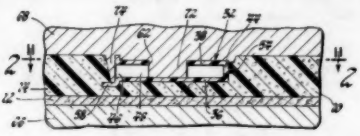
METHOD OF MOLDING A HOLLOW RETAINER IN A FOAM ARTICLE

Robert D. Thomas, Sterling Heights, Mich., assignor to General Motors Corporation, Detroit, Mich.

Filed Oct. 23, 1981, Ser. No. 314,251

Int. Cl.³ B29D 3/00, 27/00

U.S. Cl. 264—46.7 1 Claim



1. A method by which a previously molded hollow plastic retainer having a top wall with an opening adapted to receive the enlarged head of a fastener and side wall structure defining an open end portion, necessitated by the need to withdraw therefrom a mold core used in previously molding the hollow plastic retainer, may be embedded in a molded trim article with the opening at the surface of the trim article and with the side wall structure and the open end portion defined thereby beneath the surface and yet the molding material is prevented from flowing through the open end portion and filling the hollow provided for receiving the head of the fastener, said method comprising the steps of:

loading the molded plastic retainer between a first mold portion having both a projection to extend into the opening to locate the retainer in the mold with the opening of the retainer at the surface of the trim article and a wall extending generally perpendicularly from the first mold portion into sealing contact with the side wall structure defining the open end portion of the molded plastic retainer and a second mold portion spaced from the first mold portion to define the desired confines of the molded trim article in which the plastic retainer is to be embedded;

injecting the molding material for the molding of the molded trim article into the space between the first and second mold portions; and

separating the first and second mold portions after the curing of the molding material whereby the plastic retainer is embedded in the molded trim article without the flow of molding material through the open end portion to fill the desired hollow for receiving the head of the fastener in the molded plastic retainer.

4,400,337

METHOD FOR PRODUCTION OF METAL MAGNETIC PARTICLES

Yukihiro Hayashi, Suita; Toshinobu Sueyoshi, Kyoto; Shigeo Hirai, Ohtsu; Mikio Kishimoto, Kyoto; Katsunori Tashita, Suita, and Masahiro Amemiya, Takatsuki, all of Japan, assignors to Hitachi Maxell, Ltd., Osaka, Japan

Filed Jan. 5, 1982, Ser. No. 337,149

Claims priority, application Japan, Jan. 10, 1981, 56-2310; Jan. 10, 1981, 56-2312; Jan. 10, 1981, 56-2314; Jan. 10, 1981, 56-2315

Int. Cl.³ C04B 15/14

U.S. Cl. 264—82 10 Claims

1. A method for the production of acicular metal magnetic particles comprising predominantly iron, which comprises the steps of coating the surface of metal compound particles containing predominantly acicular iron oxyhydroxide or iron oxides with at least one member selected from the group consisting of an aluminum compound and a silicon compound, pelletizing the coated particles to form pellets having an average size of from 0.5 to 30 mm, and reducing the thus produced pellets with heating under reducing atmosphere.

4,400,338

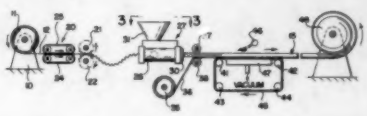
METHOD FOR MAKING SEALANT

John R. Rundo, Strongsville, Ohio, assignor to Tremco, Incorporated, Cleveland, Ohio

Filed Feb. 16, 1982, Ser. No. 348,906

Int. Cl.³ B29F 3/10

U.S. Cl. 264—171 6 Claims



1. A method for the manufacture of a deformable sealant strip comprising the steps of supplying a continuous length of rigid flat strip of material having spaced side edges, crimping said rigid material into a corrugated ribbon having peaks and valleys defining a sine wave, feeding said corrugated ribbon into an extruder, embedding said corrugated ribbon into a deformable mass of sealant containing an adhesive and a desiccant wherein said sealant fills said valleys and covers said peaks, extruding said embedded ribbon as a continuous length sealant strip along a linear pass line with said ribbon being retained therein in a corrugated form and winding said sealant strip in a roll with a disposable liner between adjacent surfaces.

5. An apparatus for forming a sealant strip comprising an extruder with a cylindrical bore, means for working and extruding material as an extrudate therethrough, a cross head connected to said extruder, a chamber in said cross head communicating with said bore for receiving extrudate therefrom, a die head with an opening therethrough at one end of said cross head from which said extrudate issues therefrom, a sleeve mounted in said cross head for directing a corrugated strip thereinto, said sleeve having an exit opening in said chamber closely adjacent said die head but spaced therefrom to allow said extrudate into said valleys and to encapsulate said corrugated strip thereby forcing the movement of said strip through said cross head.

4,400,339

PROCESS FOR PRODUCING VERY FINE DENIER SYNTHETIC FIBERS

Ulrich Reinehr; Toni Herbertz, both of Dormagen; Hermann J. Jungverdorben, Grevenbroich, and Joachim Dross, Dormagen, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Filed Dec. 4, 1980, Ser. No. 213,531

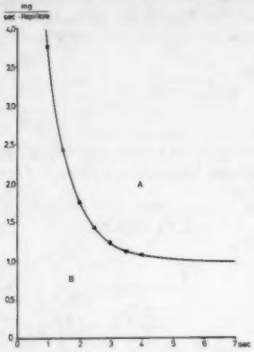
Claims priority, application Fed. Rep. of Germany, Dec. 21, 1979, 2951803

Int. Cl.³ D01F 6/18

U.S. Cl. 264—206 6 Claims

1. A process for the production of synthetic acrylonitrile fibers and filaments having at least 40% by weight acrylonitrile units and individual as spun deniers of 3 dtex and less from filament-forming synthetic polyacrylonitrile polymers containing at least 40% by weight acrylonitrile units by a dry spinning process and further treating the spun material in a manner

known per se to produce finished fibers or filaments, comprising spinning a viscosity-stable spinning solution in an organic



solvent under thermal conditions such that a draft of at least 30 is established.

4,400,340

METHOD FOR MAKING A DICYCLOPENTADIENE THERMOSET POLYMER

Daniel W. Klosiewicz, Newark, Del., assignor to Hercules Incorporated, Wilmington, Del.

Filed Jan. 25, 1982, Ser. No. 342,453
Int. Cl.³ B29F *1/08;* C08F *4/78*
U.S. Cl. 264—328.6 16 Claims

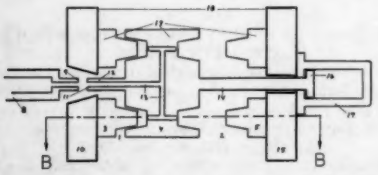
1. A method of making a thermoset homopolymer comprising: first, combining a plurality of reactant streams, one of which contains the activator of a metathesis-catalyst system combined with a moderator, and a second which contains the catalyst of said metathesis-catalyst system and at least one of which contains dicyclopentadiene to form a reaction mixture and then, immediately injecting the reaction mixture into a mold where polymerization occurs.

4,400,341

INJECTION MOLDING OF THERMOPLASTICS IN SANDWICH MOLD EMPLOYING DESYNCHRONIZED OPENING, EXTENDED AND CLOSING PERIODS

Jens O. Sorensen, Rancho Santa Fe, Calif., assignor to Universal Commerce and Finance N.V., Georgetown, Cayman Islands

Continuation-in-part of Ser. No. 197,001, Oct. 14, 1980, abandoned. This application Jun. 19, 1981, Ser. No. 275,408
Int. Cl.³ B29F *1/00*
U.S. Cl. 264—328.8 11 Claims



1. A method of injection molding a thermoplastic material to produce a product in a sandwich mold comprising at least two ejection ports, each having a cooling cavity and a single runner system for feeding the two cooling cavities, wherein each ejection port passes through a retracted period and a protracted period which together make up its production cycle, wherein the retracted period comprises an injection period and a cooing period, wherein the protracted period comprises an opening period, an extended period or point in time, and a closing period, wherein the retracted periods for the two ejection ports overlap, and wherein the injection periods for both of the two ejection ports occur during each overlapping period, the method being characterized by the step of:

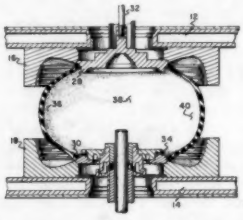
(a) desynchronizing the opening, extended and closing periods of a first ejection port with the respective opening, extended and closing periods of a second ejection port.

4,400,342

BLADDERLESS, CLAMPLESS CURING

Brian M. Logan, Akron, Ohio, assignor to The Goodyear Tire & Rubber Company, Akron, Ohio

Filed Mar. 23, 1981, Ser. No. 246,817
Int. Cl.³ B29H *5/02*
U.S. Cl. 264—501 9 Claims



1. A method of molding and curing a cylindrically to toroidally shaped elastomeric article in a mold having upper and lower mold portions without the use of a curing bladder or clamping means to seal the article against the mold comprising the steps of: placing the article over the lower mold portion, initiating closing of the mold, initiating the flow of low pressure media into the article cavity, providing relative movement of the article toward contact with the upper mold portion as the mold continues to close, positioning the article over the upper mold portion using the lower pressure media for initially locating the article to enable the article to seat on the upper mold portion, sealing the article against the lower and upper mold portions to form a pressure chamber of the article cavity by continuing the flow of low pressure media after contact of the article with the mold portions to further seat the article on the mold portions, closing the mold, providing curing media to the article cavity in place of the low pressure media suitable to cure the article and providing the remaining conventional steps to complete the cure of the article.

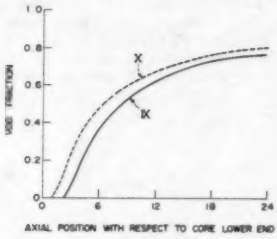
9. An apparatus for molding and curing a cylindrically to toroidally shaped elastomeric article without the use of a curing bladder or clamping means to seal the article against the mold comprising: a mold having upper and lower mold portions, means for placing the article over the lower mold portion, means for initiating closing of the mold, means for initiating the flow of low pressure media into the article cavity, means for providing relative movement of the article toward contact with the upper mold portion as the mold continues to close, low pressure media means for positioning the article over the upper mold portion for initially locating the article to seat on the upper mold portion and for sealing the article against the lower and upper mold portions to form a pressure chamber of the article cavity by continuing the flow of low pressure media after contact of the article with the mold portions to further seat the article on the mold portions, means for closing the mold, and means for providing curing media to the article cavity in place of the low pressure media suitable to cure the article.

4,400,343

SYSTEM AND METHOD FOR CONTROLLING OPERATION OF BOILING WATER REACTOR

Masayuki Izumi, and Renzo Takeda, both of Hitachi, Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Oct. 17, 1979, Ser. No. 85,686
Claims priority, application Japan, Oct. 18, 1978, 53-127999; Sep. 19, 1979, 54-119372
Int. Cl.³ G21C 7/32
U.S. Cl. 376—417 22 Claims



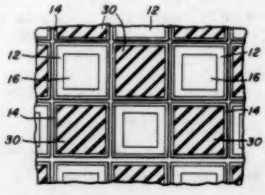
1. A system for controlling the operation of a boiling water reactor, comprising first detector means for detecting the pressure in the reactor vessel, second detector means for detecting the flow rate of the cooling water flowing in the core in the reactor vessel, third detector means for detecting the flow rate of the steam supplied to a turbine from said reactor vessel, means for setting the enthalpy of said cooling water at the inlet of said core at a value in dependence on the reactor power, said set value rendering the void fraction in the lower part of the core when the reactor power is less than a predetermined maximum value to be greater than the void fraction in the lower part of the core when the reactor power is at the predetermined maximum value so as to flatten the power distribution in the axial direction of the core when the reactor power is less than the predetermined maximum value, means for adjusting the enthalpy of the feed water supplied to said reactor vessel, and means for controlling said feed water enthalpy adjusting means on the basis of said pressure, said cooling water flow rate and said steam flow rate detected by said first, second and third detector means respectively and said cooling water enthalpy set by said setting means, thereby effecting a start-up of the reactor.

4,400,344

STORAGE RACK FOR NUCLEAR FUEL ASSEMBLIES

William J. Wachter, R.D. 4, English Rd., Wexford, Pa. 15090, and Thomas R. Robbins, 1528 Crofton Pkwy., Crofton, Md. 21114

Filed Nov. 14, 1977, Ser. No. 851,038
Int. Cl.³ G21C 19/00
U.S. Cl. 376—272 3 Claims



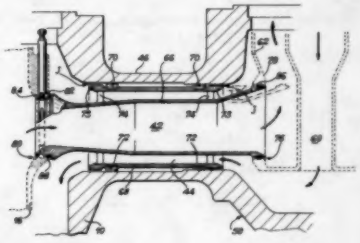
1. A storage rack for spent nuclear fuel assemblies comprising a plurality of abutting substantially square cells each of substantially the same cross-sectional area and each adapted to contain at least one fuel assembly, said cells being disposed in alignment with each other in a checkerboard array with adjacent cells connected together to form a modular rack, at least selected ones of said cells including neutron-absorbing material, solid radiation-shielding material completely encasing the rack, said shielding material comprising concrete filling at least one outer row of cells on all sides of the rack, and concrete slabs covering the entire top and bottom surfaces of the rack.

4,400,345

NUCLEAR BOILER WITH CONCENTRIC TUBES AND REMOVABLE SAFETY SLEEVE

Robert Pierart, Nantes, and Daniel Moutard, Maurepas, both of France, assignors to Commissariat a l'Energie Atomique, Paris, France

Filed Oct. 17, 1980, Ser. No. 197,909
Claims priority, application France, Oct. 30, 1979, 79 26871
Int. Cl.³ G21C 9/00
U.S. Cl. 376—292 6 Claims



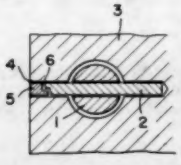
1. A nuclear boiler comprising a vessel having an upper part sealed by a removable cover, a basket-shaped member carrying a reactor core and separating the vessel into a hot inner area and a cold outer area, at least one steam generator positioned within the vessel and comprising a tightly sealed enclosure and a tube plate separating the enclosure into a primary part or water box and a secondary part, the tube plate carrying U-tubes having ends issuing into a cold area and a hot area of the water box defined by an inner structure, two linear, coaxial tubes defining an inner tube and an annular outer tube respectively connecting the hot areas and cold areas of the vessel and the water box, a removable safety sleeve having a wall designed to resist the pressure in the primary circuit of the boiler, and arranged coaxially within the outer annular tube and defining with the latter a calibrated clearance making it possible to limit to a given value the leakage flow if the outer tube fractures.

4,400,346

CONTROL RODS

Tatsuyoshi Aisaka; Mituo Kawai; Suteto Hasegawa, all of Yokohama, and Takeo Nawai, Kokubunji, all of Japan, assignors to Tokyo Shibaura Denki Kabushiki Kaisha, Kanagawa, Japan

Filed Sep. 22, 1980, Ser. No. 189,329
Claims priority, application Japan, Sep. 29, 1979, 54-124753
Int. Cl.³ G21C 7/10
U.S. Cl. 376—327 2 Claims



1. In a control rod to be arranged in a nuclear reactor core

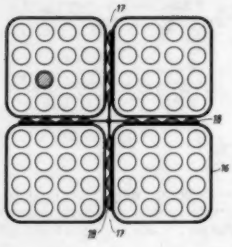
of the type comprising a body of a control rod, control rod guide rollers attached to said body of the control rod, pins connected to said guide rollers, and fixing members secured to said body of the control rod, the improvement in which each of said pins is made of a material subjected to a hardening treatment and has one end to be engaged with a corresponding one of said fixing members with a clearance therebetween thereby to prevent rotation of said pin with respect to said fixing member, and each of said fixing members comprises a portion to be engaged with a corresponding one of said pins and a portion to be welded to said body of the control rod, said pins being thermally apart from said welded portions of sajd fixing members and slidably supporting the guide rollers.

4,400,347

ABSORBER MEMBER FOR MOUNTING IN THE LATTICE OF A BOILING WATER REACTOR

Bo Fredin, and Olov Nylund, both of Västeras, Sweden, assignors to AB Asea Atom, Västeras, Sweden

Filed Apr. 29, 1981, Ser. No. 258,821
Claims priority, application Sweden, Jun. 13, 1980, 8004411
Int. Cl.³ G21C *7/10*
U.S. Cl. 376—333 **4 Claims**



1. An absorber member stationarily arranged in a boiling water reactor in a gap between two bundles of vertical fuel rods, comprising at least one absorber plate which contains burnable absorber material, each of the two side surfaces of said absorber plate facing a corresponding bundle of fuel rods, said absorber plate (**B**; **18**; **19**) containing a first (**3***b*; **6**; **10**) and a second (**2***b*; **7**; **11**) sheet element, arranged adjacent to each other, each providing one of said side surfaces, at least said first sheet element having a corrugated shape with a plurality of mutually parallel wave ridges (**4***b*; **6'**; **12**), said first and second sheet elements being connected to each other by means of a plurality of welded joints arranged on said wave ridges, a plurality of channels (**5***b*; **8**; **9**) being defined between said first sheet element and said second sheet element, said channels being filled with said burnable absorber material.

4,400,348

ALLOY FOR OCCLUSION OF HYDROGEN

Yasuaki Osumi, Minoo; Hiroshi Suzuki, Ikeda; Akihiko Kato, Matsubara; Keisuke Oguro, Ikeda, and Masanori Nakane, Ibaraki, all of Japan, assignors to Agency of Industrial Science & Technology and Ministry of International Trade & Industry, both of Tokyo, Japan

Filed Jan. 5, 1981, Ser. No. 222,351
Claims priority, application Japan, Jun. 3, 1980, 55-75314
Int. Cl.³ C22C *19/03*
U.S. Cl. 420—443 **6 Claims**

1. A quaternary alloy for storage of hydrogen, exhibiting low dissociation pressure of hydride and high speed of hydrogen release, and having a composition represented by the general formula:

$$Mm_{1-x}Ca_xNi_{5-y}A_y$$

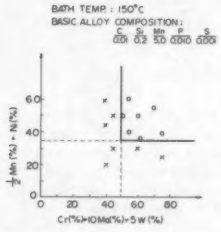
wherein, Mm stands for Mischmetal, A for one member selected from the group consisting of Al, Co, Cr, Fe, Mn, Si and Zn, x for a number within the range of from 0.01 to 0.99 and y for a number within the range of from 0.05 to 3.

4,400,349

ALLOY FOR MAKING HIGH STRENGTH DEEP WELL CASING AND TUBING HAVING IMPROVED RESISTANCE TO STRESS-CORROSION CRACKING

Takeo Kudo, Suita; Yasutaka Okada, Nishinomiya; Taishi Moroishi, Kobe; Akio Ikeda, Hyogo; Hiroo Ohtani, Kobe, and Kunihiko Yoshikawa, Suita, all of Japan, assignors to Sumitomo Metal Industries, Ltd., Osaka, Japan

Filed Jun. 17, 1982, Ser. No. 389,484
Claims priority, application Japan, Jun. 24, 1981, 56-97961; Jun. 24, 1981, 56-97962; Jun. 24, 1981, 56-97963
Int. Cl.³ C22C *19/00*
U.S. Cl. 420—443 **21 Claims**



1. An alloy for making high strength deep well casing and tubing having improved resistance to stress corrosion cracking at temperatures of 150° C. or less under H_2S-CO_2-Cl^- conditions, the alloy composition consisting essentially of:

C:	≦ 0.1%	Si:	≦ 1.0%
Mn:	3–20%	P:	≦ 0.030%
S:	≦ 0.005%	N:	0–0.30%
sol. Al	≦ 0.5%	Ni:	25–60%
Cr:	22.5–35%	Mo:	0–4% (excl.)
W:	0–8% (excl.)		
	Cr(%) + 10 Mo(%) + 5 W(%) ≧ 50%		
	½ Mn(%) + Ni(%) ≧ 35%		
	1.5% ≦ Mo(%) + ½ W(%) < 4%		
Cu:	0–2.0%	Co:	0–2.0%
Rare Earths:	0–0.10%	Y:	0–0.20%
Mg:	0–0.10%	Ti:	0–0.5%
Ca:	0–0.10%		
Fe and incidental impurities: balance.			

4,400,350

PALLADIUM DENTAL ALLOY

Armin C. Wagner, Mine Hill, N.J., assignor to W. C. Heraeus GmbH, Hanau am Main, Fed. Rep. of Germany

Filed Sep. 29, 1982, Ser. No. 427,283
Int. Cl.³ C22C *5/04*
U.S. Cl. 420—464 **5 Claims**

1. A homogeneous fine grained palladium alloy consisting essentially of

	Weight Percent
Pd	70–82
Au	0.1–10
In	5–10
Cu	2–5
Ga	0.5–5
Sn	0.5–5
Co	0.9–2.7

-continued

	Weight Percent
Re	0.01–0.3

and between 0.08 and 0.25% of at least one metal selected from the group consisting of Ru and Ir.

4,400,351

HIGH THERMAL RESISTANCE, HIGH ELECTRIC CONDUCTIVITY COPPER BASE ALLOY

Shinichi Komori, Ohmiya; Yasushi Shimanuki, Urawa, and Isamu Suzuki, Yono, all of Japan, assignors to Mitsubishi Kinzoku Kabushiki Kaisha, Tokyo, Japan

Filed Jun. 2, 1981, Ser. No. 269,687

Claims priority, application Japan, Jun. 13, 1980, 55-79711; Dec. 1, 1980, 55-169402

Int. Cl.³ C22C *9/00*

U.S. Cl. 420—489 **14 Claims**

1. A high thermal resistance, high electric conductivity copper base alloy consisting essentially of from 0.0005 to 0.01 percent boron, from 0.002 to 0.05 percent magnesium, a material selected from the group consisting of phosphorus from 0.001 to 0.01 percent, indium from 0.002 to 0.03 percent, tellurium from 0.001 to 0.06 percent and mixtures thereof, and the balance copper and inevitable impurities.

14. A high thermal resistance, high electric conductivity copper base alloy consisting essentially of from 0.0005 to 0.0031 percent boron, a material selected from the group consisting of phosphorus from 0.001 to 0.01 percent, indium from 0.002 to 0.03 percent, tellurium from 0.001 to 0.06 percent and mixtures thereof, and the balance copper and inevitable impurities.

4,400,352

METHOD AND A DEVICE FOR OPTIMIZING PURIFICATION OF DIESEL EXHAUST GASES

Ove A. Rehnberg, Pitea, and Anders J. Sundgren, Lulea, both of Sweden, assignors to Unikat AB, Sweden

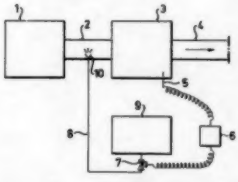
PCT No. PCT/SE80/00232, § 371 Date May 27, 1981, § 102(e) Date May 27, 1981, PCT Pub. No. WO81/00880, PCT Pub. Date Apr. 2, 1981

PCT Filed Oct. 1, 1980, Ser. No. 269,006

Claims priority, application Sweden, Oct. 1, 1979, 7908108

Int. Cl.³ C01B *21/36*

U.S. Cl. 422—4 **6 Claims**



1. A method of optimizing purification of diesel exhaust gases particularly with regard to NO_2, the exhaust gas purification being carried out by a catalyst, comprising selectively reducing the exhaust gas temperature by injecting an agent having a lower temperature than the exhaust gases into the exhaust gases before the gases enter the catalyst such that the temperature within the catalyst remains within a predetermined low temperature range of 230°–280° C. which minimizes the quantity of NO_2 leaving the catalyst.

3. A device for optimizing purification of diesel exhaust gases particularly with regard to NO_2, comprising a diesel engine, catalyst means for purifying the exhaust gases, means for measuring the temperature of the exhaust gases in the catalyst means, means for selectively adding a substance to the exhaust gases in dependence on the measured temperature before the exhaust gases enter the catalyst to cool said gases and to maintain said gases in the catalyst within a predetermined low temperature range of 230°–280° C., said substance having a lower temperature than the exhaust gases, whereby the quantity of NO_2 leaving the catalyst is minimized.

4,400,353

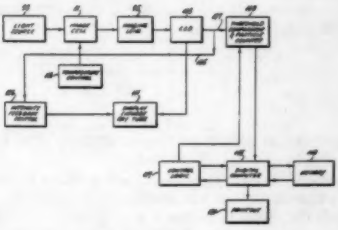
ELECTRO-OPTICAL SYSTEM FOR USE IN EVALUATING IMMUNOLOGICAL REACTIONS

Peter M. Meserol, Montville, and Jesse L. Acker, Rockaway, both of N.J., assignors to Akro-Medic Engineering, Inc., Whippany, N.J.

Division of Ser. No. 835,996, Sep. 23, 1977, Pat. No. 4,197,088. This application Nov. 26, 1979, Ser. No. 97,196

Int. Cl.³ G01N *21/51, 33/16*

U.S. Cl. 422—73 **6 Claims**



1. An electro-optical system for use in evaluating immunological reactions, said system comprising:

(a) an image cell comprising a pair of opposed planar surfaces, each surface having a generally circular groove such that when said surfaces are bonded together, said grooves form a reaction zone confined between said planar surfaces, one of said grooves including an aperture through which a biological fluid and a reagent therefore are introduced into said reaction zone,

(b) a light source from which beams of radiant energy impinge on said reaction zone,

(c) an image sensor having a photosensitive surface consisting of photosensitive elements, said image sensor being electrically connected to a display means,

(d) an imaging lens for focusing the light transmitted through said reaction zone of said image cell on the surface of said image sensor wherein dark imaged area appear corresponding to agglutinated particles in said reaction zone,

(e) focusing means operably connected to said imaging lens for adjusting the focus plane in said reaction zone, and,

(f) a threshold comparator and particle counter for rejecting dark imaged areas smaller than predetermined threshold levels and counting dark imaged areas greater than said threshold level.

4,400,354

APPARATUS USEFUL FOR ANALYZING REFRACTORY SUBSTANCES

Robert F. Culmo, Woodbridge, Conn., assignor to The Perkin-Elmer Corporation, Norwalk, Conn.

Filed Feb. 19, 1981, Ser. No. 235,781

Int. Cl.³ G01N *31/12*

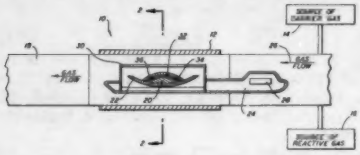
U.S. Cl. 422—78 **7 Claims**

1. In combination with a non-refractory sample elemental analyzer, including a furnace having an upper temperature limit capable of oxidizing only non-refractory materials having a sample delivery tube extending therethrough, an apparatus for oxidizing a refractory sample; said apparatus comprising:

an open, hollow, cylindrical heat containment member hav-

ing said refractory sample therein, said member being within said sample delivery tube positioned within said furnace of said analyzer; and

a layer of powdered material overlying said refractory sample, said powdered material being exothermically reactive



at a temperature less than said upper limit of said furnace, whereby when said powdered material exothermically reacts, the temperature limit available for oxidizing said refractory sample is extended such that said refractory sample is vaporized.

4,400,355

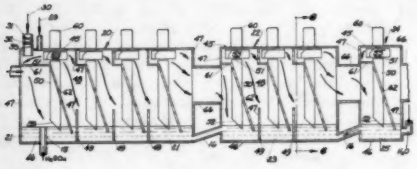
APPARATUS FOR DESULFURIZING COMBUSTION GASES

Francis M. Donnelly, deceased, late of Saint Petersburg, Fla., by Marion Y. Donnelly, personal representative, 4570 Overlook Dr., Saint Petersburg, Fla. 33703

Filed Dec. 7, 1981, Ser. No. 327,931

Int. Cl.³ B01D *47/16*

U.S. Cl. 422—170 **5 Claims**



3. In apparatus for removing sulfur oxides from the gaseous combustion products of sulfur-containing fossil fuel and for producing sulfuric acid in a reaction chamber, the improvement which comprises at least two modules in series in said reaction chamber, each said module comprising a confining housing having top, bottom and side walls, a substantially vertical elongated duct centrally positioned in said housing, said duct having orifices at the top and bottom thereof, the top orifice being substantially horizontal, the bottom orifice having a non-horizontal configuration such that a portion thereof is adapted to be partially submerged in a reservoir of sulfuric acid in said housing, a plurality of fan blades positioned within said housing closely above said top orifice substantially in axial alignment with said duct, means for rotating said fan blades whereby to raise said gaseous combustion products in an upwardly spiraling vortex through said duct, baffle means dividing said housing into inlet and outlet sections, respectively, said bottom orifice communicating only with said inlet section, said top orifice communicating with said outlet section, said baffle means permitting communication between said inlet and outlet sections only through said duct, an inlet to said housing in said inlet section, and an outlet from said housing in said outlet section communicating with an inlet of a succeeding like module in said series, said baffle means having a sloping section guiding said gaseous products from said outlet section to said inlet of said succeeding module.

4,400,356

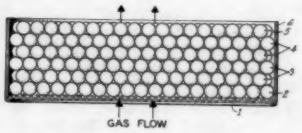
COMBUSTION CATALYST BED

Donald R. McVay, Simsbury, and Herbert J. Setzer, Ellington, both of Conn., assignors to United Technologies Corporation, Hartford, Conn.

Filed Feb. 1, 1982, Ser. No. 344,897

Int. Cl.³ B01D *53/36*

U.S. Cl. 422—171 **8 Claims**



1. In a catalytic combustor comprising combustion catalyst material so selected and constituted so as to combust uncombusted gases from a previous combustion reaction, wherein the improvement comprises utilizing such catalysts in a bed configuration comprising a support screen, a layer of substantially fully catalyst impregnated particulate material next to the support screen, a layer of surface catalyst impregnated particulate material next to the fully impregnated material, and a layer of uncatalyzed particulate material next to the layer of surface impregnated material, the thickness of the layers and particulate size so constituted as to substantially fully combust the uncombusted gases passing therethrough with a minimal pressure drop across the bed.

4,400,357

DEVICE FOR STERILIZING MEDICAL AND DENTAL OBJECTS

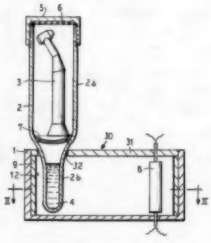
Eugen Hohmann, Bensheim, Fed. Rep. of Germany, assignor to Siemens Aktiengesellschaft, Berlin & Munich, Fed. Rep. of Germany

Filed Aug. 19, 1981, Ser. No. 294,363

Claims priority, application Fed. Rep. of Germany, Sep. 9, 1980, 3033855; Apr. 29, 1981, 81103233

Int. Cl.³ A61L *2/08, 2/20*

U.S. Cl. 422—297 **23 Claims**



1. A device for sterilizing medical and dental objects, such as instruments and the like, by contacting the object with a gas produced by heating a liquid reaction agent, said device comprising a single vessel having an enlarged portion forming a first container for receiving the object to be sterilized, a narrow portion forming a second container for receiving said liquid reaction agent and having a volume substantially smaller than the volume of the first container and a connecting portion forming means for interconnecting the interiors of said first and second containers to enable flow of fluid and gases therebetween; and means for heating the liquid reaction agent in the second container to produce a hot gas for sterilizing each object in the first container, said means for heating including a source of radiation, means for creating an area of high energy density for the radiation, and means for positioning the second

container in the area of high energy density so that the liquid reaction agent in the second container is heated to a temperature to vaporize it into a hot gas, which flows through the means for interconnecting to sterilize each object in the first container.

4,400,358

METHOD AND ADSORBANT COMPOSITION FOR ^{82}RB GENERATION

Rudi D. Neirinckx, East Windsor, N.J., assignor to E. R. Squibb & Sons, Inc., Princeton, N.J.

Continuation-in-part of Ser. No. 162,858, Jun. 25, 1980, abandoned. This application Nov. 21, 1980, Ser. No. 208,918

Int. Cl.[3] **C01G** *19/02;* **A61K** *43/00, 49/00*

U.S. Cl. 423—2 **13 Claims**

6. A low ^{82}Sr breakthrough method of generating ^{82}Rb from a ^{82}Sr charged adsorbant comprising eluting the ^{82}Rb from said adsorbant with an eluant solution wherein said adsorbant is selected from the group consisting of tin oxide, hydrated tin oxide, polyantimonic acid, hydrated titanium oxide, and hydrated ferric oxide.

4,400,359

PROCESS FOR THE HOT OXIDIZED ATTACK ON A URANIFEROUS ORE BY A CONCENTRATED ALKALINE LIQUOR WITH SIMULTANEOUS URANIUM PRECIPITATION

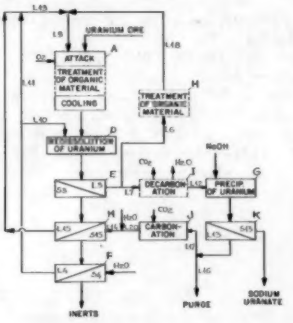
Pierre Maurel, and François Nicolas, both of Aix en Provence, France, assignors to Aluminium Pechiney, Lyons, France

Filed Jul. 25, 1980, Ser. No. 172,140

Claims priority, application France, Jul. 27, 1979, 79 19910; Feb. 5, 1980, 80 02879; Mar. 18, 1980, 80 07119

Int. Cl.[3] **C22B** *60/02*

U.S. Cl. 423—15 **47 Claims**



1. A continuous process for attack of uraniferous ore for the recovery of uranium values comprising

(a) attacking the uraniferous ore in divided form by means of an attack liquor of alkaline carbonate and bicarbonate and uranium in a concentration close to its limit of solubility and at a temperature within the range of 40°–300° C., in the presence of an oxidizing agent for dissolution of uranium values present in the ore,

(b) directing the suspension resulting from the attack on the uraniferous ore of step (a) to another vessel,

(c) cooling the suspension to a temperature which does not go below 40° C. to divide the suspension into a solid phase containing the uranium values and sterile material and a liquid phase,

(d) separating the solid phase from the liquid phase of the suspension of step (c),

(e) treating the separated solid phase with an aqueous liquor to redissolve the uranium values and to recover the liquid phase entrained with the separated solid material, and

(f) separating the slurry from step (e) into a solid sterile material and a useful uraniferous liquor from which the uranium values may be recovered.

28. A continuous process for attack of uraniferous ore for the recovery of uranium values comprising

(a) attacking the uraniferous ore in divided form by means of an attack liquor of alkaline carbonate and bicarbonate and uranium in a concentration close to its limit of solubility and at a temperature within the range of 40°–300° C., in the presence of an oxidizing agent for dissolution of uranium values present in the ore,

(b) cooling the suspension resulting from the attack on the uraniferous ore of step (a) to a temperature which does not go below 40° C. to divide the suspension into a solid phase containing the uranium values and sterile material and a liquid phase,

(c) treating the suspension with an aqueous liquor to redissolve the uranium values and to recover the liquid phase entrained with the separated solid material, and

(d) separating the suspension from step (c) into a solid sterile material and a useful uraniferous liquor from which the uranium values may be recovered.

4,400,360

RECOVERY OF GADOLINIUM AND GALLIUM OXIDES

David Nalewajek, West Seneca, N.Y., assignor to Allied Corporation, Morris Township, Morris County, N.J.

Filed Dec. 1, 1982, Ser. No. 445,824

Int. Cl.[3] **C01F** *17/00;* **C01G** *15/00*

U.S. Cl. 423—21.1 **10 Claims**

1. A method for recovering gadolinium and gallium oxides from by-product material which contains these oxides, transition metals and various other impurities comprising the steps of:

(a) dissolving the by-product material which contains the gadolinium and gallium oxide in an acid medium,

(b) isolating the filtrate,

(c) precipitating gadolinium values from said filtrate by forming gadolinium oxalate,

(d) separating, washing and drying the precipitated gadolinium oxalate,

(e) converting the gadolinium oxalate salt from step (d) to gadolinium oxide by pyrolysis,

(f) basifying the filtrate of step (b),

(g) adding sulfide ion to the filtrate of step (f) to precipitate therefrom the transition metal sulfides from the aqueous solution and filtering the solids,

(h) acidifying the filtrate from step (g) and oxidizing residual sulfide ion from said filtrate by the addition of an oxidant, and adjusting the pH of the filtrate to a base condition to precipitate gallium hydroxide, and

(i) isolating, drying and calcining the gallium hydroxide from step (h) to yield gallium oxide.

4,400,361

METHOD OF REMOVING H_2S FROM A GAS STREAM UTILIZING BORON-VANADIUM AND IRON COMPLEXES

Ronald E. Shafer, Overland Park, Kans., assignor to Purtec Systems, Inc., Overland Park, Kans.

Filed Mar. 30, 1982, Ser. No. 363,647

Int. Cl.[3] **B01D** *53/34*

U.S. Cl. 423—226 **30 Claims**

1. In a method of removing H_2S from a sour gas by oxidation of the H_2S to free sulfur, the improved steps of:

bringing the sour gas into H_2S absorbing relationship with a liquid alkaline absorption medium whereby H_2S is absorbed and at least part thereof forms [HS^-] ions,

said liquid absorption medium being essentially devoid of anthraquinone disulfonic acid compounds and containing a vanadium-boron complex capable of oxidizing the [HS^-] ions to produce elemental sulfur as the vanadium undergoes reduction and the boron constituent functions

to inhibit formation of insoluble vanadium sulfide compounds and consequent thiosulfate formation upon re-oxidation of the vanadium,

the ratio of boron to vanadium in said absorption medium being at least about 1:1;

regenerating the absorption medium by adding an oxygen source thereto to oxidize the reduced vanadium; and

providing a sufficient quantity of an iron complex catalytic agent during regeneration of the absorption medium which is capable of catalyzing re-oxidation of the reduced vanadium to enhance oxidation of the latter without deleteriously affecting recoverability of free sulfur from the absorption medium.

4,400,362

REMOVAL OF NITROGEN OXIDES FROM GAS

Bernard J. Lerner, 727 Orchard Hill Dr., Pittsburgh, Pa. 15238

Filed Nov. 4, 1981, Ser. No. 317,948

Int. Cl.[3] C01B *21/00, 21/20, 21/48;* C01C *1/18*

U.S. Cl. 423—235 15 Claims

1. The method of removing nitrogen oxide and nitrogen dioxide from a gas comprising reacting the nitrogen oxides with sulfurous acid, and oxygen in a wet scrubbing operation, thereafter reacting the gaseous product of the reaction of the sulfurous acid and oxygen and the nitrogen oxides with an alkaline solution in a wet scrubbing operation to convert the said product into a salt, the reaction of the nitrogen oxides with the sulfurous acid and oxygen converting the nitrogen oxides into a compound which is readily converted into a salt.

4,400,363

METHOD FOR THE REMOVAL OF SULFUR OXIDES AND NITROGEN OXIDES FROM EXHAUST GASES

Horst Grochowski, Oberhausen, and Karl Knoblauch, Essen, both of Fed. Rep. of Germany, assignors to Bergwerksverband GmbH, Essen, Fed. Rep. of Germany

Filed Apr. 13, 1981, Ser. No. 253,652

Claims priority, application Fed. Rep. of Germany, Apr. 18, 1980, 3014934

Int. Cl.[3] B01J *8/00;* C01B *21/00, 17/00*

U.S. Cl. 423—239 3 Claims

1. In a method for removal of sulfur oxides and nitrogen oxides from exhaust gases, which additionally contain oxygen and steam, by addition of gaseous ammonia at temperatures between about 110° and 180° C., whereby the exhaust gases travel in the interior of a reactor across a travelling bed, which goes from above to below, of granulated, carbon-containing adsorbent, whereby in a first travelling bed initially a large portion of the sulfur oxides is absorptively removed and in a second travelling bed after dosed addition of gaseous ammonia the nitrogen oxides are catalytically reduced to nitrogen as well as further sulfur oxides being separated, the improvement comprising extending the path of said exhaust gas between said first and said second travelling bed and introducing into the volume of the exhaust gas stream between said first and said second travelling bed a forced mixture of dosed added ammonia with the exhaust gas departing from said first travelling bed.

4,400,364

PROCESS FOR OXIDIZING CARBON MONOXIDE IN THE PRESENCE OF METHACROLEIN

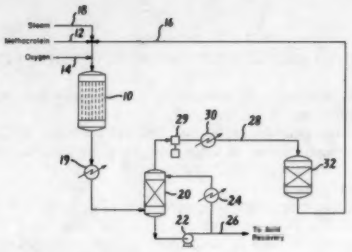
David A. Storm, Montvale, N.J., assignor to The Halcon SD Group, Inc., New York, N.Y.

Filed Jul. 17, 1981, Ser. No. 284,155

Int. Cl.[3] C07C *51/16;* C01B *31/18;* B01D *53/36*

U.S. Cl. 423—247 5 Claims

1. A process for the selective vapor phase oxidation of carbon monoxide to carbon dioxide with molecular oxygen in the presence of methacrolein comprising passing a mixture comprising >0–80 vol % carbon oxides, >0–30 vol % oxygen, >0–10 vol % methacrolein, >0–20 vol % water and inert gases at a temperature within the range of about 200°–350° C. selected to oxidize carbon monoxide with substantially no loss of methacrolein over a catalyst comprising a crystalline alumino silicate having pores no larger than about 4–5 angstroms diameter and containing substantially only within said pores at least one noble metal or compound thereof of the group consisting of platinum, palladium, rhodium, and iridium.



4,400,365

METHOD FOR THE MANUFACTURE OF ALUMINUM ZINC PHOSPHATE HYDRATES OR BASIC ALUMINUM ZINC PHOSPHATE HYDRATES

Wigo Haacke; Gerhard Adrian, both of Goslar; Manfred Gawol, Clausthal-Zellerfeld; Rainer Heubach, Goslar, all of Fed. Rep. of Germany, assignors to Goslarer Farbenwerke, Langelsheim and Dr. Hans Heubach GmbH & Co. KG, Goslar, both of, Fed. Rep. of Germany

Filed Dec. 1, 1981, Ser. No. 326,184

Claims priority, application Fed. Rep. of Germany, Dec. 11, 1980, 3046698

Int. Cl.[3] C01B *15/16, 25/26*

U.S. Cl. 423—306 11 Claims

1. A method for the manufacture of aluminum zinc phosphate hydrates or basic aluminum zinc phosphate hydrates comprising reacting 1 mole of aluminum hydrogen phosphate with 2.4 to 4 moles of zinc oxide and, thereafter, recovering the aluminum zinc phosphate hydrates or basic aluminum zinc phosphate hydrates.

4,400,366

METHOD OF MAKING ZEOLITES

Robert N. Sanders, Baton Rouge, La., assignor to Ethyl Corporation, Richmond, Va.

Filed Sep. 8, 1981, Ser. No. 299,878

Int. Cl.[3] C01B *33/28*

U.S. Cl. 423—329 24 Claims

1. A method of producing a crystalline synthetic faujasite, comprising the steps of separately preparing a sodium silicate solution and a sodium aluminate solution, providing an activated system comprising a sodium silicate solution mixed with agitation for a period of at least about one-half hour with a seed amount of bulk synthetic faujasite of the type product desired ground to a fine powder at a temperature up to about 0° C. mixing the sodium aluminate solution with the activated system over a period of up to about five hours to provide a mixture having a silica to alumina molar ratio of between 2.5:1 and 15:1, allowing the mixture to stand for up to about sixteen hours at a temperature from about 0° C. to ambient, heating the mixture to a temperature of about 90° C.–105° C., reacting the mixture at a temperature of about 90° C.–105° C. until the desired crystalline synthetic faujasite is formed, and recovering said faujasite.

4,400,367

HYDROGEN PEROXIDE ADDUCT AND PROCESS FOR PREPARATION AND USE THEREOF

Werner Doetsch, Bad Hoenningen; Helmut Honig, Gelting, and Rudolf Siegel, Neuwied, all of Fed. Rep. of Germany, assignors to Peroxid-Chemie GmbH, Hoellriegelskreuth, Fed. Rep. of Germany

Filed Sep. 29, 1982, Ser. No. 427,313

Claims priority, application Fed. Rep. of Germany, Oct. 16, 1981, 3141152

Int. Cl.³ C01B *17/46*

U.S. Cl. 423—463 7 Claims

1. An adduct of the formula

$$4Na_2SO_4.2H_2O_2.KCl.$$

2. A process for the preparation of the adduct as defined by claim 1, comprising the step of: crystallizing the adduct out of a suspension containing from about 100 to 900 g of hydrogen peroxide per liter of solution and a quantity of sodium sulphate and potassium chloride which exceeds the saturation concentration of the adduct at the crystallization temperature, whereby the weight ratio of sodium sulphate to potassium chloride is in the range of from about 2:1 to 12:1.

4,400,368

H_2S REMOVAL PROCESS

Zaida Diaz, Houston, Tex., assignor to Shell Oil Company, Houston, Tex.

Continuation of Ser. No. 324,358, Nov. 24, 1981, abandoned. This application Sep. 30, 1982, Ser. No. 430,468

Int. Cl.³ C01B *17/04;* B01D *53/34*

U.S. Cl. 423—573 R 20 Claims

1. A process for the removal of H_2S from a sour gaseous stream comprising:

(a) contacting the sour gaseous stream in a contacting zone with an aqueous reaction solution at a temperature below the melting point of sulfur, the solution containing an effective amount of a reactant selected from the group consisting of oxidizing polyvalent metal chelate compounds, and mixtures thereof, and a stabilizing amount of a nitrogen-containing composition selected fro N,N-diethylhydroxylamine, thiourea, thioemicarbazide, and mixtures thereof, and producing a sweet gas stream and an aqueous admixture containing crystalline sulfur and a reduced reactant;

(b) removing at least a portion of the crystalline sulfur from the aqueous admixture;

(c) regenerating the aqueous admixture in a regeneration zone to produce a regenerated reactant;

(d) returning aqueous admixture containing regenerated reactant from the regeneration zone to the contacting zone.

4,400,369

APPARATUS AND PROCESS FOR RECOVERING HEAT EMANATING FROM THE SHELL OF A THERMAL REACTOR IN A SULFUR RECOVERY PLANT

John W. Palm, Tulsa, Okla., assignor to Standard Oil Company (Indiana), Chicago, Ill.

Filed Apr. 19, 1982, Ser. No. 369,944

Int. Cl.³ C01B *17/02;* C22B *26/10*

U.S. Cl. 423—574 R 8 Claims

1. A method for combusting acid gas with air in a Claus plant thermal reactor wherein air is passed between a shell of the thermal reactor and a jacket to maintain the shell at a predetermined temperature by absorbing heat emanating therefrom, said method comprising:

recovering heat emanating from the shell by collecting resulting heated air and combining the collected heated air with acid gas to increase reactant temperatures in the Claus plant thermal reactor to produce an acid gas-air mixture;

passing said acid gas-air mixture through a reaction zone in said thermal reactor to produce a products stream including elemental sulfur vapor, water, and gas and sulfur dioxide;

passing said products stream through a heat recovery zone; then,

passing said products stream through a catalytic reaction zone to produce vaporized sulfur in said products stream; and then,

passing said products stream through a condenser zone to condense and remove elemental sulfur therefrom.

4,400,370

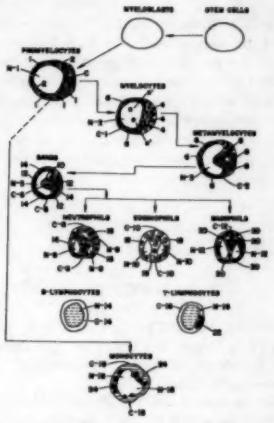
METACHROMATIC DYE SORPTION MEANS FOR DIFFERENTIAL DETERMINATION OF LEUKOCYTES

Lawrence Kass, 1939 Ridge Rd., Hinckley, Ohio 44233

Continuation-in-part of Ser. No. 129,680, Mar. 12, 1980. This application Mar. 11, 1981, Ser. No. 242,662

Int. Cl.³ G01N *1/30, 33/48, 33/52*

U.S. Cl. 424—3 12 Claims



1. A method for analysis of human blood whereby normal or pathological blood leukocytes including leukemic lymphoblasts present in a human blood specimen are made selectively spectrally determinant which comprises preparing at least one leukocyte containing specimen in a supravital, fixative-free state by contact in an aqueous environment with the dye basic orange #21; each of the above dye-stained species present in said classes of blood components sorbing said dye metachromatically and differentially as exhibited by (1) the presence or absence of characteristic color and pattern of the nucleus and cytoplasm and (2) the relative number, size, arrangement or pattern and color or colors of the granules present, or not present in the cytoplasm.

5. In a dye staining method for differential analysis of human blood specimen whereby mature leukocytes, immature leukocytes and other blood fragment components present in said specimen are made selectively determinant, one from the other, enabling differentiation and enumeration of all of said blood component species consisting essentially of neutrophils, eosinophils, basophils, lymphocytes, lymphoblasts and monocytes as well as myeloblasts, promyelocytes, myelocytes, metamyelocytes, platelets, bands, T-cells and B-cells; the method which comprises metachromatically staining a human blood containing specimen within a temperature range of 21°-40° C. in an aqueous, supravital, fixative-free state with substantially chemically pure, organic basic quaternary cationic dyestuff comprising basic orange #21; thereafter and thereby enabling identification, differentiation and enumeration of any one or all of the aforesaid blood component species

present in said blood specimen under white light absorbance means.

4,400,371

CARNITINE AND ITS USE IN REDUCING CARDIAC TOXICITY AND AS A SYNERGIST WITH CYTOSTATS

Stephen L. De Felice, Westfield, N.J., assignor to Biocarn Ltd., New York, N.Y.

Division of Ser. No. 115,113, Jan. 24, 1980, abandoned, which is a division of Ser. No. 966.057, Dec. 4, 1978, which is a continuation-in-part of Ser. No. 681,063, Apr. 28, 1976, Pat. No. 4,075,352, which is a continuation-in-part of Ser. No. 485,301, Jul. 2, 1974, Pat. No. 3,968,241, which is a continuation-in-part of Ser. No. 303,772, Nov. 6, 1972, Pat. No. 3,830,931. This application May 12, 1981, Ser. No. 262,901

Int. Cl.³ A61K *31/70*

U.S. Cl. 424—10 5 Claims

1. A method of reducing cardiac toxicity in humans which results from the administration to such human of a cytostat selected from the group consisting of Daunomycin, N-acetyl-Daunomycin and Daunomycin oxine, which comprises administering to said human in combination with said cytostat, an amount of β-hydroxy-γ-trimethylaminobutyric acid, a pharmaceutically acceptable salt thereof, an isomer thereof or a pharmaceutically acceptable salt of an isomer thereof sufficient to reduce cardiac toxicity.

4,400,372

CHEWING GUM

Joseph C. Muhler, Howe; Carl J. Kleber, Fort Wayne, both of Ind.; Ronald L. Ream, North Aurora, and David M. Moore, Lombard, both of Ill., assignors to Indiana University Foundation, Bloomington, Ind.

Continuation-in-part of Ser. No. 240,793, Mar. 4, 1981. This application Jan. 15, 1982, Ser. No. 339,754

Int. Cl.³ A61K *9/68*

U.S. Cl. 424—48 12 Claims

1. A chewing gum capable of cleaning and imparting a high degree of polish to the teeth consisting essentially of:

a chewing gum base;

a non-toxic source of acid present in an amount sufficient to produce an aqueous pH of from about 2.6 to about 3.3 when measured in a solution with a concentration of 0.1 gram by total gum weight of said chewing gum to 1 milliliter of demineralized water; and

about 1–50% by total gum weight of calcined kaolin particles, the median diameter of the particles being about 2 micrometers or less, substantially all of the particles being less than about 20 micrometers in diameter.

4,400,373

METHOD FOR TREATING GINGIVAL AND PERIODONTAL TISSUES

Milton Hodosh, 72 Overhill Rd., Providence, R.I. 02906

Filed Dec. 15, 1981, Ser. No. 331,456

Int. Cl.³ A61K *7/16, 33/00*

U.S. Cl. 424—49 7 Claims

1. The method of reducing gingival bleeding and improving the texture and consistency of gingival and periodontal tissues by applying thereto a composition comprising about 1–23% by weight of potassium nitrate.

4,400,374

CONTROLLED RELEASE OF COMPOUNDS UTILIZING A PLASTIC MATRIX

Nathan F. Cardarelli, Barberton, Ohio, assignor to Environmental Chemicals, Inc., Wauconda, Ill.

Continuation-in-part of Ser. No. 51,102, Jun. 22, 1979, Pat. No. 4,299,613, which is a continuation-in-part of Ser. No. 14,118, Feb. 20, 1979, Pat. No. 4,228,614, which is a continuation-in-part of Ser. No. 5,174, Jan. 22, 1979, Pat. No. 4,237,114, which is a continuation-in-part of Ser. No. 916,570, Jun. 19, 1978, Pat. No. 4,166,111. This application Jul. 24, 1980, Ser. No. 171,835

The portion of the term of this patent subsequent to Aug. 28, 1996, has been disclaimed.

Int. Cl.³ A01N *55/04*

U.S. Cl. 424—78 51 Claims

1. A floating controlled release pesticide dispenser, comprising:

a polymer, an aquatic pesticide, and a porosity inducing agent,

said polymer in the form of a matrix and containing said aquatic pesticide and said porosity inducing agent,

the amount of said polymer being 100 parts by weight,

said polymer of said matrix selected from the group consisting of a thermoplastic polymer, a thermoset polymer, and combinations thereof;

said aquatic pesticide being a pesticide for destroying aquatic pests in an aqueous environment, the amount of said pesticide ranging from about 2 parts by weight to about 80 parts by weight per 100 parts of said polymer except when said pesticide is an organotin compound, the amount of said organotin compound ranging from about 25 to about 75 parts; and

said aquatic pesticide slowly being released from the dispenser;

said dispenser having a density of less than 1.0 grams per cc; and

an anchor, said anchor having a density of greater than 1.0 grams per cc and connected to said dispenser.

4,400,375

TOBRAMYCIN-DOUBLE STRANDED RNA COMPLEX SUITABLE FOR INDUCING INTERFERON

Richard J. Douthart, Martinsville; Walter J. Kleinschmidt, and Richard M. Schultz, both of Indianapolis, all of Ind., assignors to Eli Lilly and Company, Indianapolis, Ind.

Filed Nov. 23, 1981, Ser. No. 324,241

Int. Cl.³ A61K *45/04;* C07H *21/02*

U.S. Cl. 424—85 10 Claims

1. A complex comprising (a) natural or synthetic double stranded RNA and (b) tobramycin in a molar ratio of tobramycin to double stranded RNA phosphorus of at least about 1:1.

6. A pharmaceutical composition suitable for inducing interferon comprising in combination with a pharmaceutically acceptable carrier an interferon-inducing amount of a complex of (a) natural or synthetic double stranded RNA and (b) tobramycin in a molar ratio of tobramycin to double stranded RNA phosphorus of at least about 1:1.

4,400,376

IMMUNOLOGICAL PREPARATIONS

Arnold R. Sanderson, East Grinstead, England, assignor to National Research Development Corporation, London, England

PCT No. PCT/GB80/00055, § 371 Date Nov. 17, 1980, § 102(e) Date Nov. 17, 1980, PCT Pub. No. WO80/01986, PCT Pub. Date Oct. 2, 1980

PCT Filed Mar. 27, 1980, Ser. No. 224,565

Claims priority, application United Kingdom, Mar. 27, 1979, 7910639

Int. Cl.³ A61K *39/00, 39/385;* C07G *7/00*

U.S. Cl. 424—88 28 Claims

1. An antigenic material in combination with a major histo-

compatibility complex antigen which is is itself in the form of a complex with a protein with which it is normally associated in nature or with a modified form of such protein which retains the epitope thereof intact, said antigenic material being attached to the protein of the complex through antibody to that protein.

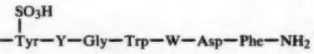
24. A method for the production of an immunogenic response in a mammal or bird to an antigenic material which comprises administering thereto said antigenic material in combination with a major histocompatibility complex antigen which is itself in the form of a complex with a protein with which it is normally associated in nature or with a modified form of such protein which retains the epitope thereof intact, said antigenic material being attached to the protein of the complex through antibody to that protein.

4,400,377
USE OF POLYPEPTIDES AS ANALGESIC DRUGS

Gerhard Zetler, Lübeck, Fed. Rep. of Germany; Alessandro Rossi, and Chiara De Paolis, both of Milan, Italy, assignors to Farmitalia Carlo Erba, S.p.A., Milan, Italy

Continuation-in-part of Ser. No. 191,146, Sep. 26, 1980, Pat. No. 4,351,829. This application Mar. 5, 1982, Ser. No. 355,252
The portion of the term of this patent subsequent to Sep. 28, 1999, has been disclosed.
Int. Cl.³ A61K *37/00*
U.S. Cl. 424—177 **8 Claims**

1. A method of inducing analgesia in animal and human patients suffering from severe pains selected from biliary and renal colic pains, pains caused by peripheral vascular diseases of the extremities, migraine, chronic pains in cancer diseases, post-operatory-, traumatological-, large burns-, myocardial infarction- and angina pectoris-pains, which comprises administering to the patient in need an effective amount of a polypeptide of the general structure:



wherein

X is selected from the group consisting of hydrogen, t-butyloxycarbonyl(Boc), Asp, Pyr-Glu, Pyr-Gln-Asp, Pyr-Asn-Asp;

Y is selected from the group consisting of Thr, Met, Leu, Nle, Val;

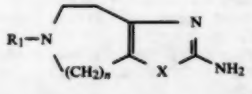
W is selected from the group consisting of Met, Nle, Leu.

4,400,378
PHARMACEUTICAL COMPOSITION FOR THE TREATMENT OF GLAUCOMA

Hendricus C. Innemee; Jacobus C. A. van Meel, both of Amsterdam; Adriaan De Jonge, Driebergen; Petrus B. M. W. M. Timmermans, Ouderkerk a.d. Amstel, and Pieter A. van Zwieten, Amsterdam, all of Netherlands, assignors to Karl Thomae Gesellschaft mit beschränkter Haftung, Biberach an der Riss, Fed. Rep. of Germany

Filed Nov. 2, 1981, Ser. No. 317,260
Int. Cl.³ A61K *31/33*
U.S. Cl. 424—244 **7 Claims**

1. The method of treating glaucoma in a warm-blooded animal, which comprises topically administering to the affected eye of said animal an effective intraocular pressure reducing amount of a compound of the formula



wherein

R_1 is hydrogen, alkyl of 1 to 4 carbon atoms, hydroxy-(alkyl of 1 to 4 carbon atoms), benzyl, halo-benzyl, methyl-benzyl, methoxy-benzyl or allyl;

X is oxygen or sulfur; and

n is 2;

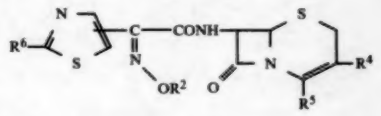
or a non-toxic, pharmacologically acceptable acid addition salt thereof.

4,400,379
CEPHEM COMPOUNDS

Takao Takaya, Kawanishi; Hisashi Takasugi; Kiyoshi Tsuji, both of Osaka, and Toshiyuki Chiba, Nara, all of Japan, assignors to Fujisawa Pharmaceutical Company, Limited, Osaka, Japan

Division of Ser. No. 886,340, Mar. 14, 1978. This application Sep. 15, 1981, Ser. No. 302,681
Claims priority, application United Kingdom, Mar. 14, 1977, 10699/77; Japan, Jul. 12, 1977, 52-29245; Oct. 11, 1977, 52-42315; Jan. 3, 1978, 53-75
Int. Cl.³ C07D *501/20*; A61K *31/545*
U.S. Cl. 424—246 **10 Claims**

1. A syn compound of the formula:



wherein

R^2 is aliphatic hydrocarbon substituted with halogen, carboxy or esterified carboxy,

R^4 is halogen or a group of the formula: —O—R^7, in which R^7 is lower alkyl,

R^5 is carboxy or carboxy modified to a group from which carboxy may be regenerated and

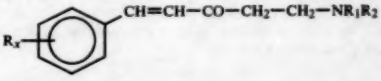
R^6 is amino or protected amino, and pharmaceutically acceptable salt thereof.

4,400,380
ANTIVIRAL 1-ARYL-5-AMINO-1-PENTEN-3-ONES

Harry W. Ritter, Loveland, and Michael L. Edwards, Cincinnati, both of Ohio, assignors to Merrell Dow Pharmaceuticals Inc., Cincinnati, Ohio

Continuation-in-part of Ser. No. 165,430, Jul. 2, 1980, abandoned. This application Jun. 22, 1981, Ser. No. 276,139
Int. Cl.³ A61K *31/445, 31/40*
U.S. Cl. 424—248.5 **8 Claims**

1. A method of treating a viral infection amenable to topical treatment comprising topically administering to a patient afflicted with such a viral infection an antivirally effective amount of a compound of the formula



wherein

R is H, halo, C_{1-4} alkyl, C_{1-4} alkoxy, 3,4-methylenedioxy, CF_3, No_2, NH_2, $N(C_{1-4}$ alkyl$)_2$, CN, OH, —S(C_{1-4} alkyl) or —SO_2(C_{1-4} alkyl); R_1 and R_2 are independently each H or C_{1-4} alkyl or taken together with the attached N atom are morpholino, piperidino, pyrrolidino, piperazino, or N-C_{1-4}—alkyl piperazino; and, when R is halo, C_{1-4} alkyl or C_{1-4} alkoxy, x is 0–3 and, otherwise, is 0 or 1;

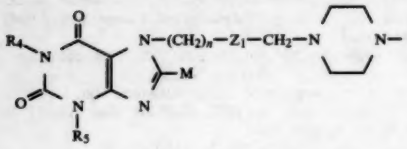
or a pharmaceutically acceptable salt thereof with an acid or for the compounds wherein R_1 and R_2 are both not H, a quaternary ammonium salt thereof.

4,400,381
PIPERAZINE DERIVATIVES OF THEOPHYLLINE

Colette Favier, Neuilly-sur-Seine; Henri Pinhas, Paris; Serge Beranger, Bretigny-sur-Orge, and Jean-Claude Pascal, Cachan, all of France, assignors to Laroche-Navarron, S.A., Puteaux, France

Filed Jul. 31, 1981, Ser. No. 288,836
Int. Cl.[3] A61K *31/52;* C07D *473/08*
U.S. Cl. 424—248.52 17 Claims

1. A compound of the formula



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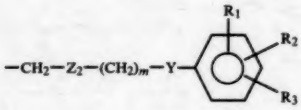
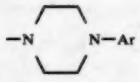


and the pharmaceutically acceptable acid addition salts thereof, wherein

M is selected from the group consisting of hydrogea, morpholino, benzylamino, di-n-lower alkylamino, n-lower alkylamino, and



wherein Ar is optionally substituted phenyl;

Z_1 and Z_2 are each independently selected from the group consisting of CH_2, CHOB and C=O, wherein B is selected from the group consisting of hydrogen and alkanoyl;

Y is oxygen or sulfur;

n is an integer from 0–4 but cannot be zero when Z_1 is CHOB;

m is an integer from 0–4 but cannot be zero when Z_2 is CHOB, or when M is hydrogen;

R_1, R_2 and R_3 are each independently hydrogen, halogen, hydroxy, trifluoromethyl, alkyl or alkoxy; and

R_4 and R_5 are each independently lower alkyl, with the proviso that both R_4 and R_5 cannot be methyl when M is hydrogen.

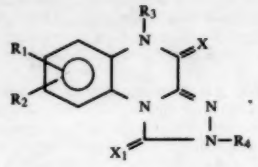
15. A pharmaceutical composition for treating respiratory diseases or effecting vasodilation in mammals, which comprises a therapeutically effective amount of the compound of claim 1 or a pharmaceutically acceptable acid addition salt thereof, in admixture with at least one pharmaceutically acceptable, non-toxic excipient.

4,400,382
THIAZOLOQUINOXALIN-1,4-DIONES FOR TREATING ALLERGY

Richard E. Brown, East Hanover, N.J.; Vassil St. Georgiev, New Rochelle, N.Y.; Philip Kropp, Meriden, Conn., and Bernard Loev, Scarsdale, N.Y., assignors to USV Pharmaceutical Corporation, Tarrytown, N.Y.

Continuation-in-part of Ser. No. 148,314, May 9, 1980, abandoned. This application Mar. 16, 1981, Ser. No. 244,361
Int. Cl.[3] A61K *31/495;* C07D *487/14, 487/04, 241/44*
U.S. Cl. 424—250 17 Claims

1. An anti-allergic compound of the formula:



wherein,

X and X^1 are S or O and may be the same or different;

each of R_1 and R_2 is hydrogen, C_1–C_{10} alkyl, C_1–C_{10} alkenyl, C_1–C_{10} alkynyl, cyclo C_3–C_{10} alkyl, C_6–C_{10} aryl, C_6–C_{10} ar C_1–C_{10} alkyl, sulfonamido, halogen, C_1–C_{10} alkoxy, C_1–C_{10} alkenyloxy, C_1–C_{10} alkynyloxy, cyano, hydroxy, nitro, amino, C_1–C_{10} alkylamino, C_1–C_{10} alkanoylamino, carb C_1–C_{10} alkoxyamino, methanesulfonyl, carboxy, carb C_1–C_{10} alkoxy, trihalomethyl, or taken together, methylenedioxy;

each of R_3 and R_4 is hydrogen, C_1–C_{10} alkyl, C_1–C_{10} alkenyl, C_1–C_{10} alkynyl, C_6–C_{10} aryl, C_6–C_{10} ar C_1–C_{10} alkyl, cyclo C_3–C_{10} alkyl, cyclo C_3–C_{10} alkyl CH_2-, or carba C_1–C_{10} alkoxy; and

pharmaceutically-acceptable acid addition salts thereof, and where R_4 is hydrogen, the alkali and alkaline-earth metal salts thereof.

2. A pharmaceutical composition for use as an antiallergic agent, said composition containing a therapeutically effective amount of a compound according to claim 1.

4,400,383
TREATMENT OF ANXIETY

Jonathan R. T. Davidson, Chapel Hill, and Anthony T. Dren, Raleigh, both of N.C., assignors to Burroughs Wellcome Co., Research Triangle Park, N.C.

Continuation-in-part of Ser. No. 329,880, Dec. 11, 1981, abandoned. This application Aug. 30, 1982, Ser. No. 413,078
Int. Cl.[3] A61K *31/495*
U.S. Cl. 424—250 26 Claims

1. The method of treating generalized anxiety disorder anxiety in a human which has been identified as exhibiting generalized anxiety disorder symptoms which comprises administering to said human an effective nontoxic generalized antianxiety disorder treatment amount of 9-[3-(3,5-cis-dimethylpiperazino)propyl]carbazole, a pharmaceutically acceptable salt thereof, or a pharmaceutically acceptable solvate of a pharmaceutically acceptable salt thereof.

4,400,384
5-O-CYANOBENZYL-4,5,6,7-TETRAHYDROTHIENO [3,2-c] PYRIDINE METHANESULFONATE AND OTHER NOVEL SALTS THEREOF

Armand Amselem, Toulouse; Fernand Eloy, Eaunes, and Jean-Pierre Maffrand, Portet, all of France, assignors to Sanofi, S.A., Paris, France

Filed Oct. 6, 1980, Ser. No. 193,906
Int. Cl.[3] C07D *513/04;* A61K *31/44*
U.S. Cl. 424—256 26 Claims

1. The methanesulfonate acid addition salt of 5-o-cyanobenzyl-4,5,6,7-tetrahydrothieno [3,2-c] pyridine.

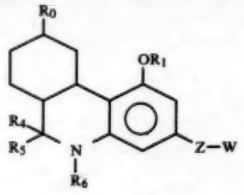
4,400,385

9-HYDROXYOCTAHYDROBENZO[c]QUINOLINES, ANALGESIC COMPOSITIONS CONTAINING THEM AND PROCESSES FOR PRODUCING ANALGESIA WITH THEM

Michael R. Johnson, Gales Ferry, Conn., assignor to Pfizer Inc., New York, N.Y.

Division of Ser. No. 193,822, Oct. 3, 1980, Pat. No. 4,340,737, which is a division of Ser. No. 42,773, May 29, 1979, Pat. No. 4,260,764, which is a continuation-in-part of Ser. No. 777,928, Mar. 15, 1977, abandoned, which is a continuation-in-part of Ser. No. 753,619, Dec. 22, 1976, abandoned, which is a continuation-in-part of Ser. No. 687,332, May 17, 1976, abandoned. This application Dec. 9, 1981, Ser. No. 328,928
The portion of the term of this patent subsequent to Jun. 3, 1997, has been disclaimed.
Int. Cl.³ A61K *31/47*; C07D *221/12*
U.S. Cl. 424—258 17 Claims

10. A process for producing analgesia in a mammal which comprises administering to the mammal an analgesic producing quantity of a compound selected from the group consisting of those having the formula



and the pharmaceutically acceptable acid addition salts thereof,

wherein

R_1 is selected from the group consisting of hydrogen, benzoyl, alkanoyl having from one to five carbon atoms and $—CO—(CH_2)_p—NR_2R_3$ wherein p is 0 or an integer from 1 to 4; each of R_2 and R_3 when taken individually is selected from the group consisting of hydrogen and alkyl having from one to four carbon atoms; R_2 and R_3 when taken together with the nitrogen to which they are attached form a 5- or 6-membered heterocyclic ring selected from the group consisting of piperidino, pyrrolo, pyrrolidino, morpholino and N-alkylpiperazino having from one to four carbon atoms in the alkyl group;

R_4 is selected from the group consisting of hydrogen, alkyl having from 1 to 6 carbon atoms and $—(CH_2)_z—C_6H_5$ wherein z is an integer from 1 to 4;

R_5 is selected from the group consisting of hydrogen, methyl and ethyl;

R_6 is selected from the group consisting of hydrogen, $—(CH_2)_y—$ carbalkoxy having from one to four carbon atoms in the alkoxy group and wherein y is 0 or an integer from 1 to 4, carbobenzyloxy, formyl, alkanoyl having from two to five carbon atoms, alkyl having from one to six carbon atoms and $—(CH_2)_x—C_6H_5$ wherein x is an integer from 1 to 4; and $CO(CH_2)_{x-1}—C_6H_5$;

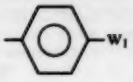
R_0 is selected from the group consisting of oxo, alkylenedioxy having from two to four carbon atoms and methylene;

Z is selected from the group consisting of

(a) alkylene having from one to nine carbon atoms;

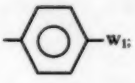
(b) $—(alk_1)_m—X—(alk_2)_n—$ wherein each of (alk_1) and (alk_2) is alkylene having from one to nine carbon atoms, with the proviso that the summation of carbon atoms in (alk_1) plus (alk_2) is not greater than nine; each of m and n is 0 or 1; X is selected from the group consisting of O, S, SO and SO_2; and

W is selected from the group consisting of hydrogen, methyl, pyridyl, piperidyl,



wherein W_1 is selected from the group consisting of hydrogen, fluoro and chloro; and

wherein W_2 is selected from the group consisting of hydrogen and



a is an integer from 1 to 5 and b is 0 or an integer from 1 to 5; with the proviso that the sum of a and b is not greater than 5.

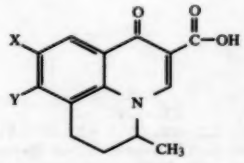
4,400,386

ANTIMICROBIAL DERIVATIVES OF 8-AMINO AND 8-AMINOMETHYL BENZO(I)QUINOLIZINE

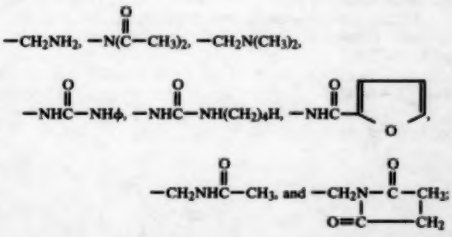
Richard M. Stern, Cottage Grove, Minn., assignor to Riker Laboratories, Inc., St. Paul, Minn.

Filed Nov. 6, 1981, Ser. No. 318,930
Int. Cl.³ A61K *31/47*; A01N *43/90*; C07D *455/04*
U.S. Cl. 424—258 5 Claims

1. A compound of the formula



wherein X is hydrogen or fluorine; Y is selected from the group consisting of



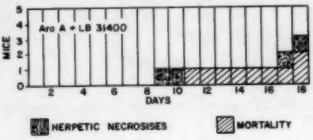
or an alkyl or aminoalkyl ester thereof having one to four carbon atoms in the alkyl group, an aminoalkyl ester salt thereof having one to four carbon atoms in the alkyl group or a pharmaceutically-acceptable carboxylate salt thereof.

5. A method of inhibiting the growth of microorganisms comprising contacting said microorganisms with an effective amount of a compound according to claims 1 or 2.

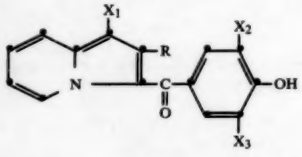
4,400,387
INDOLIZINE DERIVATIVES AND USES IN THERAPEUTICS

Gilbert Rosseels, Relegem, and Pierre Nokin, Brussels, both of Belgium, assignors to S. A. Labaz-Sanofi N.V., Paris, France

Filed Jun. 30, 1980, Ser. No. 164,838
Claims priority, application United Kingdom, Jul. 6, 1979, 7923599
Int. Cl.³ A61K 31/435; C07D 471/04
U.S. Cl. 424—263 9 Claims



1. An indolizine derivative of the formula:



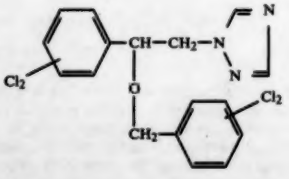
wherein R represents a straight- or branched-chain alkyl radical having from 1 to 8 carbon atoms, or a phenyl group non-substituted or bearing one or two substituents, which may be the same or different, selected from fluorine, chlorine and bromine and from lower alkyl and alkoxy groups, X_1 represents chlorine, bromine or methoxy, and X_2 and X_3, which may be the same or different, each represent hydrogen, chlorine, bromine or methoxy.

4,400,388
FUNGICIDAL 1-PHENYL-2-(1,2,4-TRIAZOL-1-YL)-ETHYL ETHERS

Helmut Timmler; Karl H. Büchel, both of Wuppertal; Wilhelm Brandes, Cologne; Paul-Ernst Frohberger, and Hans Scheinpflug, both of Leverkusen, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Continuation-in-part of Ser. No. 729,935, Oct. 6, 1976, Pat. No. 4,327,104. This application May 29, 1979, Ser. No. 43,070
Claims priority, application Fed. Rep. of Germany, Oct. 27, 1975, 2547953
Int. Cl.³ A01N 43/64; C07D 249/08
U.S. Cl. 424—269 4 Claims

1. A 1-chlorophenyl-2-(1,2,4-triazol-1-yl)-ethyl chlorobenzyl ether of the formula



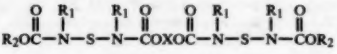
or a salt thereof with a physiologically tolerated acid.

4,400,389
PESTICIDAL SYMMETRICAL BIS-SULFENYLATED-BIS CARBAMATE COMPOUNDS

Themistocles D. J. D'Silva, South Charleston, W. Va., assignor to Union Carbide Corporation, Danbury, Conn.

Filed May 8, 1978, Ser. No. 903,533
Int. Cl.³ C07C 125/04, 125/06; C07D 235/30, 279/10; A01N 47/10, 43/84, 43/86, 43/88
U.S. Cl. 424—300 32 Claims

1. A compound of the formula:

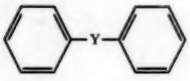


wherein:

X is:

A. a substituted or unsubstituted divalent alkylene, alkenylene, alkynylene, monocyclic arylene, bicyclic arylene, biphenylene or a divalent alkylene chain which includes one oxygen, sulfur, sulfinyl, sulfonyl or nitrogen, wherein the permissible substitutents are one or more alkyl, fluoro, nitro, chloro, or bromo groups.

B. a divalent organic radical of the formula:

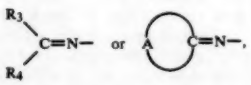


wherein:

Y is oxygen, sulfur, sulfinyl, sulfonyl, alkylene, haloalkylene, alkenylene, or haloalkenylene;

R_1 is alkyl having from one to four carbon atoms;

R_2 is:



wherein

R_3 is hydrogen alkyl, alkylthio, alkylsulfinyl, alkylsulfonyl, aminocarbonyl, alkylaminocarbonyl, dialkylaminocarbonyl or cyano;

R_4 is alkyl, alkylthio, alkylsulfinyl, alkylsulfonyl, aminocarbonyl, alkylaminocarbonyl dialkylaminocarbonyl or alkanoyl, all of which may be unsubstituted or, except for aminocarbonyl substituted with one or more cyano, amido, nitro, alkylthio, alkylsulfonyl or alkylsulfinyl;

A is a divalent chain having from 2 to 24 aliphatic carbon atoms completing a 2-oximino-1,4 dithiane, 2-oximino-1,3-dithiane, 4-oximino-1,3-dithiolane, 2-oximino-1,4-dioxane, 2-oximino-1,4-oxathiane, 2-oximino tetrahydro-1,4-thiazine-3-one, 2-oximino-1,3-dithiolane, 2-imino-4-oximino-1,3-dithiolane, 3-oximinothiophane, 2-oximinothiophane, 2-oximino-tetrahydro-1,4-oxazin-3-one, 2-oximino-1,3,5-trithiane, 4-oximino-1,3,5-oxadithiane, 2-oximino-1,3-thiazolidin-4-one, 5-oximino-1,3-thiazolidin-4-one or 2-oximino-tetrahydro-1,4-thiazine-5-one ring structure, wherein sulfur may be in any of its oxidation states.

22. An insecticidal 1 and nematocidal composition comprising an acceptable carrier and as the active toxicant an insecticidally, miticidally or nematocidally effective amount of a compound according to claim 1.

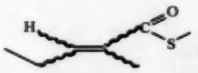
4,400,390

METHYL-THIO-2-METHYL-2-PENTENOATES

Alan O. Pittet, Atlantic Highland; Ranya Muralidhara, Fair Haven, and Manfred H. Vock, Locust, all of N.J., assignors to International Flavors & Fragrances Inc., New York, N.Y.

Filed Nov. 5, 1981, Ser. No. 318,429
Int. Cl.³ C07C *153/023;* A61K *31/265*
U.S. Cl. 424—301 4 Claims

1. Methyl-thio-2-methyl-2-pentenoate defined according to the structure:



wherein the wavy lines represent covalent bonds juxtaposed in a "cis" or "trans" configuration around the carbon-carbon double bond of the structure.

4,400,391

CONTROLLED RELEASE OF BIOACTIVE MATERIALS USING ALGINATE GEL BEADS

William J. Connick, Jr., New Orleans, La., assignor to The United States of America as represented by the Secretary of Agriculture, Washington, D.C.

Division of Ser. No. 110,865, Jan. 9, 1980, abandoned. This application Dec. 3, 1980, Ser. No. 212,655
Int. Cl.³ A01N *37/34*
U.S. Cl. 424—304 4 Claims

1. A process for preparing alginate gel beads containing insecticide materials consisting essentially of:

(a) mixing an effective quantity of alginate for gelation with an effective quantity of 1-a-cyano-c-phenoxybenzyl d, cis-dibromochrysanthemate, for incorporation into a final gel bead, in water;

(b) placing the mixture in a vessel equipped to dispense liquids dropwise;

(c) mixing an effective quantity of water-soluble metal salt or acid which can gel alginates, with an effective quantity of water to obtain a solution;

(d) adding, dropwise, the alginate mixture of (b) into the solution of (c); thus forming gel beads, which contain the insecticide material dispersed uniformly therein, allowing the beads to remain in contact with the solution of (c) for an effective period of time necessary to allow gelation, and

(e) separating the gelled beads from the solution of (c).

4,400,392

NOVEL ACARICIDE COMPOSITIONS

Jean J. Hervé, Aubagne, and Serge Smolikowski, Marseille, both of France, assignors to Roussel Uclaf, Paris, France

Division of Ser. No. 35,811, May 4, 1979, Pat. No. 4,357,350, which is a continuation-in-part of Ser. No. 906,752, May 17, 1978, abandoned. This application May 26, 1982, Ser. No. 382,175
Claims priority, application France, Apr. 6, 1977, 77 10391; Apr. 6, 1977, 77 10392
Int. Cl.³ A01N *37/34, 37/00*
U.S. Cl. 424—304 4 Claims

1. An acaricidal composition comprised of an acaricidally effective amount of a synergistic mixture of 1.5 to 50 parts by weight of (S)α-cyano-3-phenoxy-benzyl 1R, cis 2,2-dimethyl-3-(2,2'-dibromovinyl)-cyclopropane-1-carboxylate and 100 parts by weight of a mixed anhydride of benzoic acid and 3-chloro-2,6-dimethoxy-N-ethoxy-benzenecarboxyimidic acid and an inert carrier.

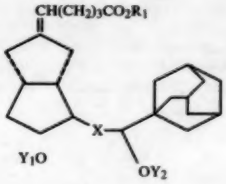
4,400,393

NOVEL BICYCLOOCTANE COMPOUNDS

Shunsuke Sami; Akihiko Sugie, both of Toyonaka; Keiichi Ono, Osaka; Hajime Kawakami; Atsuyuki Kojima, both of Takarazuka, and Junki Katsube, Toyonaka, all of Japan, assignors to Sumitomo Chemical Company, Limited, Osaka, Japan

Filed Mar. 24, 1981, Ser. No. 246,938
Claims priority, application Japan, Apr. 11, 1980, 55-48254
Int. Cl.³ C07C *59/46, 69/753;* A01K *31/215*
U.S. Cl. 424—305 21 Claims

1. A compound of the formula:



wherein R_1 is hydrogen or C_1–C_4 alkyl, X is ethylene or vinylene and Y_1 and Y_2 are each, independently of one another, hydrogen or a hydroxyl-protecting group selected from the group consisting of silyl, acetal, alkyl, aralkyl, C_2–C_6 alkanoyl, and aroyl; or a pharmaceutically acceptable salt of such a compound wherein R_1 is hydrogen.

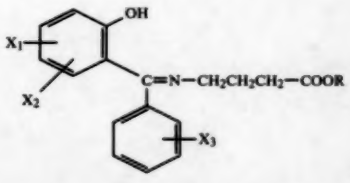
4,400,394

BENZYLIDENE DERIVATIVES

Jean-Pierre Kaplan, Plessis; Naurice Jalfre, Paris, and Don P. Giudicelli, Fontenay sous Bois, all of France, assignors to Synthelabo, Paris, France

Continuation of Ser. No. 107,512, Dec. 27, 1979, abandoned. This application Aug. 3, 1981, Ser. No. 289,148
Claims priority, application France, Aug. 1, 1975, 75 24065
Int. Cl.³ C07C *101/30;* A61K *31/195*
U.S. Cl. 424—319 14 Claims

1. A compound of the formula:



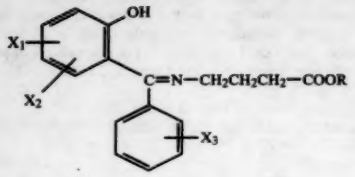
(X)

wherein,

each of X_1, X_2, and X_3 is independently hydrogen, halogen, methyl, or methoxy, and

R is hydrogen or an alkali metal atom.

2. A pharmaceutical composition for the treatment of epilepsy or convulsions in dosage unit form comprising a compound of the formula:



(X)

wherein,

each of X_1, X_2, and X_3 is independently hydrogen, halogen, methyl, or methoxy; and

R is hydrogen or an alkali metal atom;

said compound being present in an effective amount to relieve epilepsy or convulsions, and a pharmaceutically effective carrier therefor.

4,400,395

ALLYLSULFOXIDE ENZYME INHIBITORS

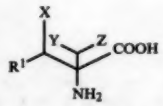
Raymond A. Firestone, Fanwood, N.J., assignor to Merck & Co., Inc., Rahway, N.J.

Division of Ser. No. 147,656, May 7, 1980, Pat. No. 4,332,813, which is a continuation-in-part of Ser. No. 66,603, Aug. 15, 1979, abandoned. This application Feb. 18, 1982, Ser. No. 349,809

Int. Cl.³ A61K *31/195;* **C07C** *101/77*

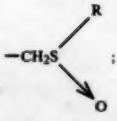
U.S. Cl. 424—319 **6 Claims**

5. A method of inhibiting enzymes in a patient in need of such treatment which comprises the administration of an enzyme inhibitory amount of a compound of structural formula:

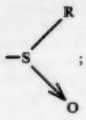


or a pharmaceutically acceptable salt thereof wherein X is hydrogen, fluoro, chloro, bromo, iodo, C_{2-4}alkanoyloxy, toluenesulfonyloxy, benzenesulfonyloxy, C_{1-3}alkanesulfonyloxy, p-nitrobenzoyloxy, or

Y is hydrogen or



and Z is fluoro, chloro, bromo, iodo, C_{2-4}alkanoyloxy, toluenesulfonyloxy, benzenesulfonyloxy, C_{1-3}alkanesulfonyloxy, p-nitrobenzoyloxy, or



or Y and Z taken together form $=CH_2$; with the proviso that one and only one of X, Y and Z is a sulfoxide, and one and only one of X and Z is halo; wherein

R is

(1) phenyl,
(2) nitrophenyl,
(3) cyanophenyl,
(4) C_{1-3}alkylsulfonylphenyl,
(5) C_{1-3}alkoxycarbonylphenyl,
(6) di(trifluoromethyl)phenyl,
(7) o-C_{1-3}alkylphenyl, or
(8) o,o-di(C_{1-3}alkyl)phenyl; and

R^1 is

(1) 3,4-dihydroxyphenyl, or
(2) 4-hydroxyphenyl.

4,400,396

ANTITHROMBOTIC TREATMENT WITH ORGANIC AMINE SULFITES AND BISULFITES

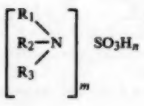
Jose A. A. Alvarez, Mexico City, Mexico, and Ralph B. Thompson, Oak Brook, Ill., assignors to T & R Chemicals, Inc., Clint, Tex.

Continuation-in-part of Ser. No. 271,849, Jun. 16, 1981, abandoned, which is a continuation-in-part of Ser. No. 227,382, Jan. 2, 1981, abandoned, which is a continuation-in-part of Ser. No. 164,303, Jun. 30, 1980, abandoned. This application Jan. 5, 1982, Ser. No. 337,100

Int. Cl.³ A61K *31/13, 31/095, 31/185*

U.S. Cl. 424—325 **18 Claims**

1. A method for treating a thrombotic condition in a mammal comprising administering to said mammal an antithrombotically effective amount of at least one agent having the formula:



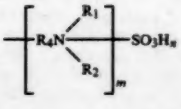
where;

R_1 is selected from the group consisting of lower alkyl radicals, cycloalkyl radicals containing from 6 to 10 carbon atoms each, lower monohydroxyalkyl radicals, and aralkyl radicals,

R_2 is selected from the groups consisting of lower alkyl radicals, lower monohydroxyalkyl radicals, and hydrogen,

R_1 and R_2 together can constitute a ring selected from this group consisting of morpholine, piperidine, and hexamethyleneimine, provided that each such ring can be substituted on one of its carbon atoms by a lower alkyl radical,

R_3 is selected from this group consisting of lower alkyl radicals lower monohydroxyalkyl radicals, hydrogen, and radicals of this formula:



R_4 is a divalent saturated lower aliphatic radical,

m and n are integers, the sum of m and n is 2, and n is either 0 or 1.

4,400,397

ANTITHROMBOTIC TREATMENT WITH QUATERNARY AMMONIUM SULFITES AND BISULFITES

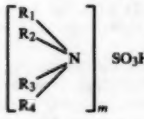
Jose A. Arias Alvarez, Carpatos, Mexico, and Ralph B. Thompson, Oak Brook, Ill., assignors to T & R Chemicals, Inc., Clint, Tex.

Continuation-in-part of Ser. No. 271,848, Jun. 16, 1981, abandoned, which is a continuation-in-part of Ser. No. 218,414, Dec. 22, 1980, abandoned, which is a continuation-in-part of Ser. No. 164,303, Jun. 30, 1980, abandoned. This application Jan. 5, 1982, Ser. No. 337,121

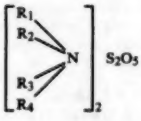
Int. Cl.³ A61K *31/14, 31/095*

U.S. Cl. 424—329 **17 Claims**

1. A method for treating a thrombotic condition in a mammal comprising administering to said mammal an antithrombotically effective amount of at least one agent characterized by the formulas:



and



wherein: R_1, R_2, R_3, R^4 are each an independently selected lower alkyl radical m and n are integers whose combined sum is equal to 2, and m is 0 or 1.

4,400,398

METHOD FOR OBTAINING AROMATICS AND DYESTUFFS FROM BELL PEPPERS

Hubert Coenen; Rainer Hagen, both of Essen, and Manfred Knuth, Hamburg, all of Fed. Rep. of Germany, assignors to Fried. Krupp Gesellschaft mit beschränkter Haftung, Essen, Fed. Rep. of Germany

Filed Apr. 5, 1982, Ser. No. 365,473

Claims priority, application Fed. Rep. of Germany, Apr. 10, 1981, 3114593

Int. Cl.³ A23L *1/277, 1/28, 1/221*

U.S. Cl. 426—429 **25 Claims**

1. Process for treating bell peppers which contain aromatics and dyestuffs by extraction of the peppers with a solvent, comprising:

extracting dried, comminuted red pepper with a solvent which is in the supercritical state with respect to pressure and temperature and which under normal conditions is a gas, at a pressure of $>p_k$ to 350 bar and a temperature of $>T_k$ to 70° C. to form (a) a charged supercritical gas phase containing an extract which comprises at least the aromatics or the dyestuffs and (b) an extraction residue;

separating the charged supercritical gas phase from the extraction residue; and

separating the extract from the separated, charged supercritical gas phase by a reduction in the density of the gas phase.

4,400,399

METHOD AND AN ARRANGEMENT FOR FEEDING FISH WITH A FODDER

Hans Müller, Erlenbach, Switzerland, assignor to Chemap AG, Maennedorf, Switzerland

Continuation of Ser. No. 42,714, May 25, 1979, abandoned, which is a continuation of Ser. No. 780,250, Mar. 22, 1977, abandoned. This application Jul. 24, 1981, Ser. No. 286,543

Claims priority, application Switzerland, Mar. 24, 1976, 3706/76; Apr. 29, 1976, 5497/76; Jul. 23, 1976, 9551/76; Jul. 26, 1976, 9623/76; Jul. 27, 1976, 9691/76

Int. Cl.³ C12K *1/00*

U.S. Cl. 426—1 **6 Claims**

1. A fish fodder which is not readily soluble in water, consisting of a gelatinless particulate nutrient matter; and a gelatin binder for said gelatinless particulate nutrient matter, said particulate nutrient matter and said gelatin binder being pelletized, said gelatin binder being soluble in warm water so as to facilitate manufacture of the pellet and swelling in cold water so as to improve attractiveness of the pellet to fish, said gelatin binder present in effective amounts to import substantial water stability to the pellet so as to prevent ready dissolution of the same in water while permitting the pellet to float.

4,400,400

ACID SOLUBLE BLUE COLORANT FOR FOOD PRODUCTS

Metty S. K. Langston, Ossining, N.Y., and Il-Young Maing, Burke, Va., assignors to General Foods Corporation, White Plains, N.Y.

Filed Mar. 26, 1982, Ser. No. 362,202

Int. Cl.³ A23L *1/272, 1/275, 2/38*

U.S. Cl. 426—51 **7 Claims**

1. A method for making an acid soluble spirulina blue pigment which comprises:

enzymatically hydrolyzing spirulina blue at a temperature of from 25° to 65° C. in an aqueous medium at a pH ranging from 7.5 to 10.0 in the presence of a proteolytic enzyme;

acidifying the aqueous alkaline hydrolyzed spirulina blue pigment to effect percipitation of acid-insoluble spirulina blue, and dissolving the separated acid-soluble spirulina blue in an aqueous alkaline solution;

and drying the liquid phase of the acidified aqueous hydrolysis medium to provide an acid soluble spirulina blue pigment in dry form.

4,400,401

METHOD OF MICROWAVE STERILIZING CANNED FOOD

Max P. Beauvais, 46 Southridge West, Tiburon, Calif. 94920, and Raymond E. Camezon, 623 Tunbridge Rd., Danville, Calif. 94526

Division of Ser. No. 122,354, Feb. 19, 1980, abandoned. This application Sep. 24, 1981, Ser. No. 305,281

Int. Cl.³ A23L *3/10*

U.S. Cl. 426—234 **3 Claims**

1. A method of sterilizing and canning food products within a non-metallic jar, comprising the steps of

placing the food products into said jar with a small quantity of liquid sufficient to cover the bottom of the interior of said jar;

placing a non-metallic lid having means capable of air-tight sealing over the mouth of said jar;

enclosing said jar and lid within an enveloping air-tight non-metallic enclosure having a one-way check valve for permitting expulsion of air and steam from the enclosure interior, and having means resiliently urging said lid against the mouth of said jar said means resiliently urging said lid against the mouth of said jar being forceable by the lid away from the jar at a predetermined pressure;

applying sufficient microwave energy to said enclosure, jar and food products to convert at least a substantial portion

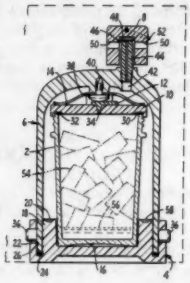
of said liquid into steam to sterilize said food products and fill said jar with steam;

continuing to apply said microwave energy to expand said steam and to expel said steam from said jar between the jar and lid as the steam forces the lid against said resilient urging means and expanding into the interior of said enclosure at said predetermined pressure for a predetermined period of time;

venting some of said steam from said enclosure through said valve;

and then discontinuing said application of microwave energy;

thereafter applying a cooling fluid to at least the lower portions of the exterior of said enclosure while preventing entry of fluids into said enclosure interior to cool said enclosure and its interior faster than said jar and lid, such



that any steam surrounding the jar inside the enclosure will condense; thereby reducing the pressure around the jar in relationship to the pressure in the jar causing said lid to raise against said resilient means thus

drawing steam out of the lidded jar until the pressure differential between the interior and exterior of the jar is reduced to a level such that said urging means will permit no further flow of said steam;

condensing said steam and cooling the food products within the jar while the lid remains resiliently urged against the jar mouth with the pressure within the enclosure and jar being substantially less than the ambient pressure exterior to the enclosure, and

venting said enclosure interior to ambient pressure, whereby the greater pressure outside the jar and reduced pressure inside the jar serves to urge the lid into an air-tight seal with the jar mouth.

4,400,402

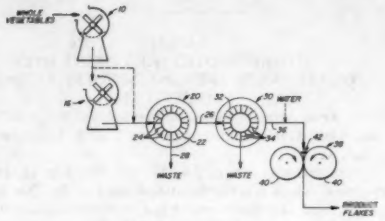
METHOD FOR PRODUCING DRIED, PUREED VEGETABLES

Bruce L. Vibbert; Fred W. Billerbeck, and Kenneth P. Hoersten, all of Fremont, Mich., assignors to Gerber Products Company, Fremont, Mich.

Filed Feb. 19, 1982, Ser. No. 350,524
Int. Cl.³ A23L *1/212*
U.S. Cl. 426—471 **4 Claims**

1. A process for dehydrating vegetables selected from the group consisting of peas and green beans, said process comprising:

comminuting the vegetables to form a puree; passing the puree through a first finisher having a screen size selected to separate a first fraction of coarse vegetable particles from the puree said screen size being in the range from about 0.060 to 0.020 inches; passing the puree through a second finisher having a finer screen size selected to further remove coarse vegetable particles from the puree said screen size being in the range from about 0.030 to 0.010



inches; and drying the twice-finished puree to form a dehydrated product.

4,400,403

PRESERVATION WITH ACYLOXY-5-HEXENOIC AND ACYLOXY-4-HEXENOIC ACIDS

Michael C. Robach, St. Peters, Mo., assignor to Monsanto Company, St. Louis, Mo.

Filed Apr. 22, 1981, Ser. No. 256,323
Int. Cl.³ A23L *3/24*; A01N *37/06*
U.S. Cl. 426—532 **13 Claims**

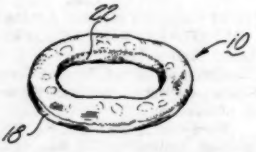
1. A method of inhibiting growth of pathogenic or food spoilage microorganisms which comprises contacting same with an effective growth inhibiting amount of acyloxyhexenoic acid selected from acyloxy-5-hexenoic acid and acyloxy-4-hexenoic acid, mixtures thereof, salts thereof and mixtures of said salts, said acyloxyhexenoic acid having up to one R_1 substituent on the alpha carbon atom, said acyloxy being represented by RCOO-, and said R and R_1 being alkyl or alkenyl having a total of up to 19 carbon atoms.

4,400,404

FOOD PRODUCT AND METHOD OF PREPARING SAME

John Persi, 323 Bella Vista Dr., Grand Blanc, Mich. 48439

Continuation of Ser. No. 642,154, Dec. 18, 1975, abandoned.
This application Dec. 14, 1981, Ser. No. 330,181
Int. Cl.³ A21D *8/02*
U.S. Cl. 426—549 **3 Claims**



1. A method of preparing a pizza comprising:

shaping a dough of a predetermined consistency into a generally rectangular shape,

placing tomato sauce and cheese and ingredients selected from the group consisting of pepperoni, ground beef, tuna fish, green peppers, anchovies, bacon, sausage, mushrooms, onions and ham along the length of one side of the rectangularly shaped dough;

folding the rectangularly shaped dough on its smaller edges over the ingredients to bring the longer edges of the dough and the folded edges into abutment;

crimping the abutting edges of the dough together to form an elongated rectangularly shaped, filled dough product;

bringing the smaller sealed edges of said elongated dough product into an end to end relationship and joining the smaller edges together to form the dough product into a toroidal shape so that the interior of said dough product is

completely sealed and so that the crimped longitudinal edges of the dough product are positioned around the outer periphery of the toroidal shaped dough product; and

heating the toroidal shaped dough product at a predetermined temperature for a predetermined period of time.

4,400,405

DIETETIC FROZEN DESSERT FOOD

Robert G. Morley, Stone Mountain, and W. Ronald Ashton, Duluth, both of Ga., assignors to Landwide Foods, Inc., Dover, Mass.

Continuation-in-part of Ser. No. 210,846, Nov. 26, 1980, Pat. No. 4,346,120. This application Jan. 26, 1981, Ser. No. 228,550

Int. Cl.³ A23G *9/02*

U.S. Cl. 426—565 14 Claims

1. A whipped, emulsified frozen food of low fat content extrudable in continuous form and coneable at temperatures at least in the range of 0° to 10° F. for serving by extrusion at home freezer temperatures,

consisting essentially, in unflavored form, of a controlled emulsion of protein, water, sugars, stabilizers, and emulsifiers,

said protein accounting for substantially 3% to 7% by weight of the product,

said water accounting for substantially 53% to 60% by weight of the product,

said sugars accounting for substantially 25% to 29% by weight of the product, and

said emulsifiers and stabilizers accounting for substantially 1.1% to 2.7% by weight of the product.

4,400,406

FROZEN DESSERT FOOD

Robert G. Morley, Stone Mountain, and W. Ronald Ashton, Duluth, both of Ga., assignors to Landwide Foods, Inc., Dover, Mass.

Continuation-in-part of Ser. No. 210,846, Nov. 26, 1980, Pat. No. 4,346,120. This application Jan. 26, 1981, Ser. No. 228,557

The portion of the term of this patent subsequent to Aug. 24, 1999, has been disclaimed.

Int. Cl.³ A23G *9/02, 9/04*

U.S. Cl. 426—565 15 Claims

1. A whipped, emulsified frozen dessert product extrudable in continuous form and coneable at temperatures at least in the range of 0° to 10° F. for serving by extrusion at home freezer temperatures,

consisting essentially, in unflavored form, of a controlled emulsion of edible fat, protein, water, sugars, stabilizers, and emulsifiers,

said edible fat accounting for up to substantially 15% by weight of the product,

said protein accounting for substantially 3% to 7% by weight of the product,

said water accounting for substantially 43% to 63% by weight of the product,

said sugars accounting for substantially 18% to 30% by weight of the product, and

said emulsifiers and stabilizers accounting for substantially 0.55% to 1.8% by weight of the product.

4,400,407

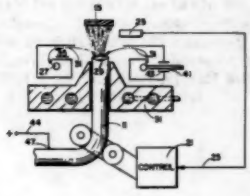
METHOD FOR DEPOSITION OF THIN FILM ALLOYS UTILIZING ELECTRON BEAM VAPORIZATION

Addison B. Jones, Yorba Linda, Calif., assignor to Rockwell International Corporation, El Segundo, Calif.

Division of Ser. No. 220,397, Dec. 29, 1980, Pat. No. 4,368,689. This application Jul. 15, 1981, Ser. No. 283,580

Int. Cl.³ C23C *13/02*

U.S. Cl. 427—8 5 Claims



1. The method of evaporation of alloys for thin film deposition on substrates comprising the steps of:

bombarding an end of a wire of alloy, selected for deposition in the vicinity of the substrate by high speed voltage attracted electrons; and,

feeding the wire to replace the end being vaporized.

4,400,408

METHOD FOR FORMING AN ANTICORROSIVE COATING ON A METAL SUBSTRATE

Hiroshi Asano, Ichikawa; Takayuki Shimamune, Machida; Toshiki Goto, Fujisawa; Hideo Nitta, Fujisawa, and Masashi Hosonuma, Fujisawa, all of Japan, assignors to Permelec Electrode Ltd., Kanagawa, Japan

Filed May 14, 1981, Ser. No. 263,542

Claims priority, application Japan, May 14, 1980, 55-62880

Int. Cl.³ B05D *3/02, 3/12*

U.S. Cl. 427—35 9 Claims

1. A method for forming an anticorrosive coating on the surface of a metal substrate, which comprises:

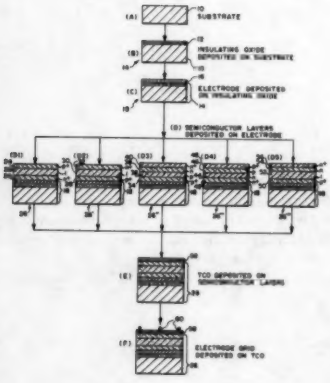
(1) coating the surface of the metal substrate with a powder of an anticorrosive metal capable of forming an alloy with the substrate metal and/or a hydride of the anticorrosive metal;
(2) heating the coated surface; and then
(3) heating the coated surface in a vacuum or in an atmosphere (substantially inert to the metal coating and the metal substrate by irradiating the coated surface with electron beams or a plasma arc to sinter the coated metal and form an alloy layer only in the interface between the metal substrate and the metal coating.

4,400,409

METHOD OF MAKING P-DOPED SILICON FILMS

Masatsugu Izu, Birmingham; Vincent D. Cannella, Detroit, and Stanford R. Ovshinsky, Bloomfield Hills, all of Mich., assignors to Energy Conversion Devices, Inc., Troy, Mich.

Filed May 19, 1980, Ser. No. 151,301
Int. Cl.³ H01L *31/18*
U.S. Cl. 427—39 **43 Claims**



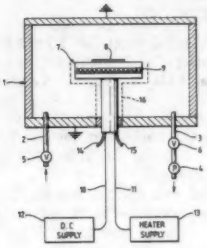
1. A method of making a p-type silicon semiconductor film, said method comprising the step of depositing on a substrate a semiconductor host matrix film including at least silicon by glow discharge of a compound containing at least silicon in a partial vacuum atmosphere and during glow discharge deposition of the film, introducing an evaporated metal p-dopant modifier element into the silicon depositing glow discharge region which metal modifier element is deposited with the glow discharge deposited silicon film to modify the same to produce a p-type film.

4,400,410

COATING INSULATING MATERIALS BY GLOW DISCHARGE

Geoffrey W. Green, Malvern, and Alan H. Lettington, Worcester, both of England, assignors to National Research Development Corporation, London, United Kingdom

Filed Aug. 14, 1981, Ser. No. 292,432
Claims priority, application United Kingdom, Aug. 21, 1980, 8027277
Int. Cl.³ C23C *11/00*
U.S. Cl. 427—39 **25 Claims**



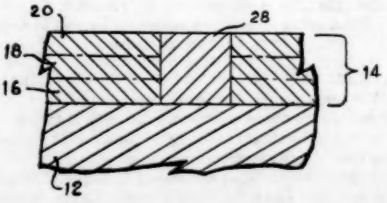
1. A method of depositing coatings on an electrically insulating material substrate in a glow discharge chamber supplied with D.C. electrical power wherein the substrate is mounted on an electrically conducting cathode of larger area than the substrate whereby the exposed area of the cathode serves to maintain a glow discharge and dark space above the substrate.

4,400,411

TECHNIQUE OF SILICON EPITAXIAL REFILL

Han-Tzong Yuan, Dallas, and Roger N. Anderson, Garland, both of Tex., assignors to The United States of America as represented by the Secretary of the Air Force, Washington, D.C.

Filed Jul. 19, 1982, Ser. No. 399,568
Int. Cl.³ B05D *5/12*; H01L *7/36*; B44C *1/22*; C03C *15/00*
U.S. Cl. 427—86 **9 Claims**



1. A process of forming a plurality of epitaxial refills in thick oxide layers using a continuous flow reactor for use in producing semiconductor devices, comprising the sequential steps of: forming a silicon substrate for supporting said epitaxial refills; treating said substrate with a first standard silicon cleaning solution;

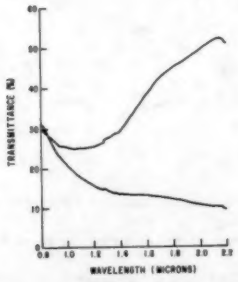
immersing said treated substrate in a first acid;
rinsing said acid from said substrate with distilled water;
forming an oxide layer on said substrate, said oxide layer comprising densified silane oxide layers;
forming a silicon nitride layer on said plurality of densified silane oxide layers;
selectively forming a photoresist layer on said silicon nitride layer;
etching to a predetermined depth selective areas of said photoresist layer, said silicon nitride layer, and said silane oxide layers;
removing the remaining photoresist with an asher;
applying a common oxide echant to the exposed silane oxide layer;
removing the remaining silicon nitride;
treating said etched oxide layer with a second standard silicon cleaning solution;
immersing said treated etched oxide and substrate in a second acid;
rinsing said second acid from said etched oxide layer and substrate with distilled water; and
filling pockets formed by etching in said silane oxide layers with said refill, said refill being substantially level to the surface of said silane oxide layers.

4,400,412

THERMOCHROMIC VANADIUM OXIDE COATED GLASS

J. Kevin Scanlon, Pittsburgh, and Charles B. Greenberg, Murrysville, both of Pa., assignors to PPG Industries, Inc., Pittsburgh, Pa.

Filed Feb. 1, 1982, Ser. No. 344,860
Int. Cl.³ B05D 5/12, 3/02; C03C 17/245
U.S. Cl. 427—87 **5 Claims**



1. A method for making a thermochromic window comprising the steps of:
a. heating a glass substrate to a sufficient temperature to convert vanadium n-propylate to vanadium oxide;
b. vaporizing vanadium n-propylate;
c. conveying the vaporized vanadium n-propylate to said substrate in an atmosphere sufficiently oxidizing to form a thermochromic film comprising VO_2 but insufficiently oxidizing to form a film which is not thermochromic as a result of the proportion of V_2O_5;
d. contacting a surface of said heated glass substrate with said vapor of vanadium n-propylate in said oxidizing atmosphere to deposit thereupon a film containing VO_2.

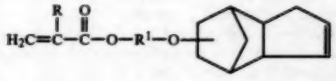
4,400,413

ACRYLIC POLYMER CONCRETE COMPOSITIONS

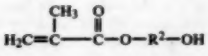
William D. Emmons, Huntingdon Valley, and Joseph A. Lavelle, Coopersburg, both of Pa., assignors to Rohm and Haas Company, Philadelphia, Pa.

Continuation-in-part of Ser. No. 182,560, Aug. 29, 1980, abandoned. This application Jul. 16, 1981, Ser. No. 283,091
Int. Cl.³ C08J 3/20; C08K 3/36
U.S. Cl. 427—136 **13 Claims**

1. An acrylic polymer concrete composition comprising an essentially anhydrous slurry of
(1) an inert inorganic particulate or granular aggregate material having a void fraction of less than 0.37; in admixture with
(2) from about 10% to 35% by weight, based on the amount of aggregate material, of a non-volatile binder monomer system comprising
(a) from about 25% to 75% by weight, based on total of monomers, of at least one dicyclopentenyloxyalkyl ester of a polymerizable α,β-unsaturated monocarboxylic acid selected from methacrylic acid or acrylic acid, the dicyclopentenyloxyalkyl ester being represented by the formula



wherein R is CH_3 or H, and
R^1 is selected from
(i) alkylene groups having 2 to 6 carbon atoms and
(ii) oxaalkylene groups having 4 to 6 carbon atoms and having one or more oxygen atoms joining distinct segments of the alkylene chain, each segment having at least 2 carbon atoms, and
(b) from about 75% to 25% by weight, based on total of monomers, of at least one hydroxyalkyl methacrylate represented by the formula



wherein R^2 is a straight or branched chain (C_1–C_6) alkyl group or a (C_3–C_6) cycloalkyl group, the total of monomers being 100%; and
(3) a polymerization catalyst selected from
(a) about 0.1% to 3% by weight, based on total of monomers, of a (C_3–C_{18}) hydrocarbyl peroxide with about 0.1% to 5% by weight, based on total of monomers, of an aromatic amine polymerization accelerator, or
(b) about 0.1% to 3% by weight, based on total of monomers, of a (C_3–C_{18}) hydrocarbyl hydroperoxide with about 0.0005% to 2% by weight, based on total of monomers, of a polyvalent metal salt or complex,
(c) mixtures of (a) and 0.0005% to 2% by weight, based on total amount of monomers, of a polyvalent metal salt or complex, or
(d) mixtures of (a) and (b).

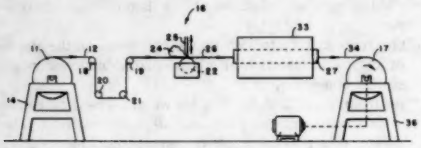
4,400,414
PROCESS FOR IMPARTING SOIL RESISTANCE TO POLYESTER-FIBER-CONTAINING TEXTILE MATERIALS

Roy P. DeMott, Spartanburg, S.C., assignor to Milliken Research Corporation, Spartanburg, S.C.

Division of Ser. No. 251,693, Apr. 7, 1981, Pat. No. 4,355,065, which is a continuation-in-part of Ser. No. 144,152, Apr. 28, 1980, abandoned. This application Oct. 19, 1981, Ser. No. 313,065

Int. Cl.³ B05D *1/00*

U.S. Cl. 427—210 **10 Claims**



1. A process for imparting soil resistance to polyester-fiber-containing textile materials containing at least 40 percent polyester by weight wherein the flame retarding characteristics of such materials are not substantially adversely affected, which comprises applying an effective minor amount of a substantially oil and water repellent fluoropolymer to the surface of the textile material by means of an engraved roll thereby covering the fibers on and near the surface of the textile material while avoiding substantial penetration of said fluoropolymer into the sections of said material that are neither at or near the surface of said material, drying and curing the resulting fluoropolymer modified textile material.

4,400,415
PROCESS FOR NICKEL PLATING ALUMINUM AND ALUMINUM ALLOYS

Richard B. Kessler, Jericho, and Fred I. Nobel, Sands Point, both of N.Y., assignors to Lea Ronal, Inc., Freeport, N.Y.

Filed Aug. 13, 1981, Ser. No. 292,580

Int. Cl.³ C23C *3/02*

U.S. Cl. 427—305 **4 Claims**

1. A process for treating aluminum and aluminum alloy substrates to improve the adhesion of subsequently applied electroless or electrolytic nickel deposits which comprises treating the substrate with a solution containing a soluble nickel or cobalt compound having a pH of about 12 or above and a non-cyanide complexing agent for the nickel or cobalt compound capable of maintaining the nickel or cobalt metal in solution at a pH of about 12 or above and which solution is further characterized by the absence of a reducing agent capable of reducing the nickel or cobalt compound to cause a buildup of nickel or cobalt metal on the substrate.

4,400,416
METHOD OF SURFACE TREATMENT AND AN APPARATUS USED IN SAID SURFACE TREATMENT

Yoshinobu Takahashi; Yasuo Tokushima; Kentarou Ogata, all of Toyota; Mamoru Suzuki, Aichi, and Zyouzi Ito, Toyota, all of Japan, assignors to Toyota Jidosha Kogyo Kabushiki Kaisha, Aichi, Japan

Filed May 19, 1981, Ser. No. 265,193

Int. Cl.³ B05D *7/14*

U.S. Cl. 427—434.5 **6 Claims**

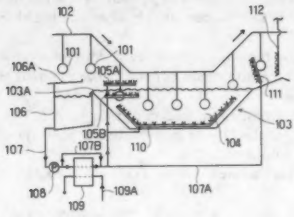
1. An apparatus for surface treating articles, comprising:

a dipping tank having a first end and a second end, said dipping tank being adapted to be filled with a treating liquid;

means for moving articles to be treated through said tank in a first direction from said first end toward said second end;

an overflow tank adjacent said first end; and

first treating liquid spray means positioned over said tank and above the level of said treating liquid at said first end, second treating liquid spray means positioned below the level of said treating liquid at said first end, said first and second spray means each comprising at least one riser extending parallel to the surface of said liquid and to said



first direction, and spray nozzles extending in said first direction on the upper surface of said risers so as to vertically spray said liquid, wherein said first and second risers and said means for moving are constructed and positioned so that said articles are sprayed only within a 30 second period before being dipped in said treating liquid and a 30 second period after being dipped in said treating liquid.

4,400,417
MOUNTING OF TILTABLE ORNAMENTS ON MOTOR VEHICLES

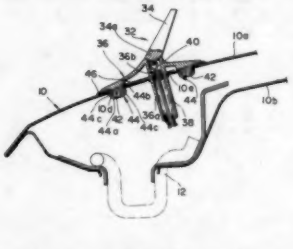
Hiroshi Kanamori, and Takeshi Kanazawa, both of Yokohama, Japan, assignors to Nissan Motor Co., Ltd., Yokohama, Japan

Filed Apr. 20, 1982, Ser. No. 370,043

Claims priority, application Japan, May 6, 1981, 56-67872

Int. Cl.³ B60R *13/04*

U.S. Cl. 428—31 **8 Claims**



1. A tiltable ornament assembly for mounting on a vehicle body comprising:

a base adapted to be supported on a panel of the vehicle body;

an ornament adapted to be supported on said base;

resilient means for yieldingly retaining said ornament in position on said base;

said base being provided with a sleeve-like extension protruding inwardly of the vehicle body through a first opening in said panel and receiving therein said resilient means;

said base being further provided with two anchor posts protruding inwardly of the vehicle body through second openings in said panel;

a base pad interposed between said base and said panel; and

two clips attached to said respective anchor posts and adapted to resiliently deform for insertion into said openings and then expand to grip said panel at a location around said second openings for thereby securing said base to said panel.

4,400,418

CYLINDRICAL COVERING FABRIC FOR A DAMPING FORM ROLLER OF AN OFFSET PRINTING MACHINE

Hirofumi Takeda, Osaka, and Hirobumi Suzuki, Kawasaki, both of Japan, assignors to M.M.T. Inc., Osaka, Japan

Filed Jun. 7, 1982, Ser. No. 386,191
Claims priority, application Japan, Aug. 10, 1982, 56/123990
Int. Cl.³ B21B *31/08*
U.S. Cl. 428—36 4 Claims

1. A cylindrical covering fabric for a damping form roller of an offset printing machine, which comprises ground yarns and hydrophilic pile yarns woven together, said ground yarn being composed of polyurethane fibers drawn to at least twice their free length, water-soluble fibers and water-insoluble fibers coiling around said polyurethane fibers and water-soluble fibers.

4,400,419

DECAL ASSEMBLY FOR INSIDE-OUTSIDE APPLICATION HAVING A REFLECTORIZED SURFACE

Antoni Laczynski, 3642 W. George St., Chicago, Ill. 60618

Filed Nov. 14, 1980, Ser. No. 206,910
Int. Cl.³ B32B *3/18*; B41M *3/12*
U.S. Cl. 428—40 8 Claims

1. A decal assembly for application to face away or toward a transparent support means comprising:

a decal having a front face with indicia thereon and a rear face;

a first pressure-sensitive adhesive on said rear face;

a first sheet having a peelable face adhered to said adhesive;

a second pressure-sensitive adhesive on the rear face of said first sheet;

and a second sheet having a peelable face adhered to said second adhesive, (a) said sheets being larger than said decal and providing a marginal edging therefor, and (b) said second sheet being removable from said second adhesive, and said first sheet being removable from said first adhesive, and said first sheet being invertable and the second adhesive thereon being adhered to said first adhesive in a position on said decal to provide a margin thereabout with the second adhesive positioned to adhere to the interior side of said support means.

4,400,420

DRIP SHIELD AND THERMAL INSULATION COVER

Wendell J. Bakken, Renton, and Phillip R. Ferguson, Seattle, both of Wash., assignors to The Boeing Company, Seattle, Wash.

Filed Jun. 1, 1982, Ser. No. 383,682
Int. Cl.³ B32B *1/04*, *35/00*
U.S. Cl. 428—99 13 Claims

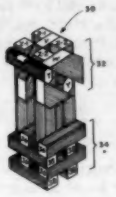
1. A flexible fluid resistant cover comprising: a fabric of high temperature resistant material of a width to overlap around aircraft flammable fluid lines to direct any leaking fluids away from potential fire areas, a temperature resistant flexible plastic impregnating the inside surface of the fabric, a metallic reflective coating on the outside surface of the fabric, and means for quickly attaching and removing the treated fabric from the flammable fluid lines.

4,400,421

FOUR-DIRECTIONAL STRUCTURE FOR REINFORCEMENT

Edward R. Stover, Akron, Ohio, assignor to The United States of America as represented by the Secretary of the Air Force, Washington, D.C.

Filed Dec. 9, 1982, Ser. No. 448,161
Int. Cl.³ B32B *5/12*
U.S. Cl. 428—113 21 Claims



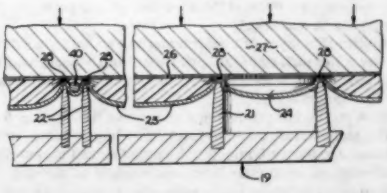
1. A 4-directional reinforcement structure for a composite material which comprises a plurality of repeating units, each unit consisting of a first, a second, a third and a fourth group, each group consisting of a plurality of elongated rectilinear elements in parallel relation and extending parallel to a respective direction and arranged in a plurality of rows; wherein a first portion of said first group of elements is disposed in a first plane and extends parallel to a first direction; wherein said second group of elements is disposed in a second plane parallel to said first plane, said second group extending parallel to a second direction which is approximately diagonal to said first direction; wherein a second portion of said first group is disposed in a third plane parallel to said first plane and extend parallel to said first direction; wherein said third group of elements is disposed in a fourth plane parallel to said first plane and extend parallel to a third direction which is approximately diagonal to said first direction and opposite the orientation of said second direction; and wherein said fourth group of elements is disposed in a plurality of spaced parallel planes, each plane being substantially perpendicular to said first direction, said fourth group extending parallel to a fourth direction which is substantially perpendicular to said first plane.

4,400,422

LAMINATED FABRIC HAVING INTEGRAL RAISED AREAS FORMED THEREIN AND METHOD OF MAKING SAME

Thomas L. Smith, Columbus, Ohio, assignor to Colamco, Inc., Columbus, Ohio

Continuation of Ser. No. 111,540, Jan. 14, 1980, abandoned. This application Jul. 19, 1982, Ser. No. 399,765
Int. Cl.³ B32B *3/12*
U.S. Cl. 428—160 27 Claims



1. A laminated fabric having at least one integral raised area formed therein comprising:

a first layer of cover material having a predetermined surface area;

a second layer of compressible foamed material of substantial thickness adjacent said first layer, said second layer having a predetermined surface area substantially corresponding to the predetermined surface area of the cover material;

at least one form disposed between said first and second layers and having a predetermined shape which generally corresponds to the desired shape of a corresponding one of said raised areas, said form overlying a portion of the predetermined surface area of said second layer;

said first layer covering said form and said second layer over the predetermined surface area thereof and being bonded to said second layer in the region surrounding said form such that the portion of the first layer which covers said form substantially conforms to the predetermined shape of said form.

4,400,423

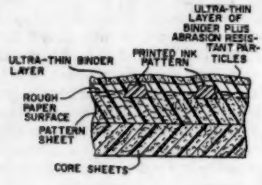
ABRASION-RESISTANT LAMINATE

Herbert I. Scher, and Israel S. Ungar, both of Randallstown, Md., assignors to Nevamar Corporation, Odenton, Md.

Division of Ser. No. 136,581, Apr. 1, 1980, Pat. No. 4,327,141, which is a division of Ser. No. 966,921, Dec. 6, 1978, Pat. No. 4,263,081, which is a continuation of Ser. No. 959,404, Nov. 9, 1978, abandoned, and a continuation-in-part of Ser. No. 879,848, Feb. 22, 1978, Pat. No. 4,255,480, which is a continuation-in-part of Ser. No. 758,265, Jan. 10, 1977, abandoned. This application Sep. 1, 1981, Ser. No. 298,402

Int. Cl.³ B32B *5/16;* **B05D** *1/12, 1/36;* **B32B** *3/00*

U.S. Cl. 428—204 **12 Claims**



1. In a print sheet for use in the preparation of decorative laminates of high abrasion resistance, comprising: a paper sheet substrate having a print design thereon, and an ultra-thin abrasion-resistant coating over said print design, said ultra-thin abrasion-resistant coating comprising a mixture of (1) an abrasion-resistant hard mineral of particle size 20–50 microns in high concentration sufficient to provide an abrasion-resistant layer without interfering with visibility and (2) binder material for said mineral compatible with a thermosetting laminating resin selected from the group consisting of melamine-formaldehyde resin and polyester resin, said coating being impregnable by said laminating resin and substantially transparent together with said resin after curing of said resin, said binder material being present in an amount sufficient to bind and stabilize said abrasion-resistant mineral to the surface of said paper sheet, the improvement comprising

an ultra-thin layer of binder material located either directly over the surface of said print sheet and beneath said ultra-thin abrasion-resistant coating, or above said abrasion-resistant coating.

10. A method of producing a decorative facing sheet for use in the manufacture of thermoset resin impregnated abrasion resistant decorative laminates having enhanced abrasion resistance without an overlay layer, the method comprising:

coating a decorative facing sheet with an ultra-thin wet layer of binder material capable of withstanding laminating conditions to make the laminate, being compatible with the thermoset resin, being in the dry state permeable to the resin before it has become thermoset and together with the thermoset resin being substantially transparent;

drying said wet ultra-thin binder material layer to provide an ultra-thin porous dry binder material layer;

coating said ultra-thin porous dry binder material layer with an ultra-thin wet layer of a mixture of (1) an abrasion-resistant hard mineral of particle size 20–50 microns in a quantity sufficient to provide an abrasion-resistant layer without interfering with visibility and (2) binder material for said mineral which binder material is capable of withstanding the subsequent laminating conditions, is compatible with the resin before it has become thermoset, together with said thermoset resin is substantially transparent, said binder material being present in an amount sufficient to bind said abrasion-resistant mineral to the surface of said ultra-thin porous dry binder material layer;

drying said mineral-binder material mixture on said ultra-thin binder material layer at a temperature sufficient to enhance the bonding of said abrasion-resistant mineral by said binder material to the surface of said ultra-thin porous dry binder material layer, to provide an ultra-thin porous dry layer of said mixture thereon.

4,400,424

FABRICS HAVING AN EXCELLENT COLOR DEVELOPING PROPERTY AND A PROCESS FOR PRODUCING THE SAME INVOLVING PLASMA TREATMENT AND AN AFTERCOAT

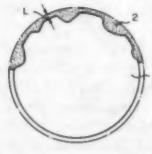
Kenji Hatada; Miyoshi Yokura, and Hiroaki Kobayashi, all of Otsu, Japan, assignors to Toray Industries, Inc., Tokyo, Japan

Filed Jun. 18, 1982, Ser. No. 389,589

Claims priority, application Japan, Jun. 24, 1981, 56-96504

Int. Cl.³ B05D *3/04, 3/06;* **D06M** *10/00, 15/72*

U.S. Cl. 428—212 **16 Claims**



1. A fabric having an excellent color developing property and having recesses of a depth of 0.05 to 1 μm and a width of 0.05 to 1 μm formed at least on the surface of the fibers existing in the surface portion of the fabric, the number of recesses being 1 to 10 per μm on the periphery of the fibers existing in the surface portion of the fabric in a portion of the fiber cross-section in which the recesses are formed and at least the recesses formed on the surface of the fibers existing in the surface portion of the fabric being coated with a coating material of an organic polymer having a refractive index at least 0.03 lower than the refractive index of the fibers.

12. A process for producing a fabric having an excellent color developing property, said process comprising treating a fabric by means of cold plasma to form at least on the surface of the fibers existing in the surface portion of the fabric recesses of a depth of 0.05 to 1 μm and a width of 0.05 to 1μm at a density of 1 to 10 per μm on the periphery of the fibers existing in the surface portion of the fabric in a portion of the fiber cross-section in which recesses are formed and then treating

the fabric with a coating material of an organic polymer having a refractive index at least 0.03 lower than the refractive index of the fibers.

4,400,425

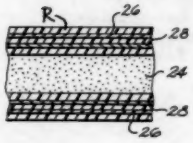
HIGH IMPACT CHEMICALLY ACTIVATED POLYESTER FIBER REINFORCED PLASTIC COMPOSITE

Vladimir Vanha, Rte. 3, Box 193B, Bryson City, N.C. 28713

Continuation of Ser. No. 132,372, Mar. 21, 1980, abandoned. This application Dec. 11, 1981, Ser. No. 329,934

Int. Cl.³ B32B *27/16, 27/36, 5/18*

U.S. Cl. 428—246 **7 Claims**



1. A high impact-fiber reinforced plastic composite structure comprising:

a resin matrix;

a plurality of treated chemically-activated polyester fibers included with said resin matrix and reinforcing fibers;

said polyester fibers being treated to have an adhesively activated surface prior to inclusion in said matrix enhancing the degree of fiber to resin adhesion in said resin matrix providing coherent bonding of said composite structure under high impact loads to effectively resist structural separation after initial impact.

2. The structure of claim 1 wherein said reinforcing fibers and said polyester fibers are laminated in said composite structure.

3. The structure of claim 2 wherein said polyester fibers include continuous filaments woven in a plain weave which is laminated in said structure.

4,400,426

THERMAL INSULATION MATERIAL COMPRISING A MIXTURE OF SILK AND SYNTHETIC FIBER STAPLE

William E. Aldrich, Ashaway, R.I., assignor to Warnaco Inc., Bridgeport, Conn.

Filed Nov. 3, 1981, Ser. No. 317,762

Int. Cl.³ B32B *27/00;* **D04H** *1/58*

U.S. Cl. 428—290 **10 Claims**

1. A thermal insulation material comprising a treated batting, said batting being formed from a carded web, said web containing at least 30 wt. % of natural silk fibers and a synthetic fiber staple, said synthetic fiber staple being formed from crimped polyester filaments having a denier per filament in the range of 1 to 6, said batting being formed by uniformly impregnating said carded web with a thermosetting resin capable of forming a relatively rigid, non-tacky structure after curing.

4,400,427

SINTERED SILICON NITRIDE CERAMIC ARTICLES HAVING SURFACE LAYERS OF CONTROLLED COMPOSITION

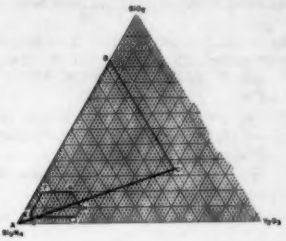
Anthony P. Moschetti; J. Thomas Smith; Carr L. W. Quackenbush, all of Acton; Helmut Lingertat, Dorchester, all of Mass., and Vincent W. Nehring, Stillwater, Minn., assignors to GTE Laboratories Incorporated, Waltham, Mass.

Filed Dec. 21, 1981, Ser. No. 333,246

Int. Cl.³ B32B *9/04;* **C04B** *35/58*

U.S. Cl. 428—332 **17 Claims**

1. A unitary, sintered, polycrystalline silicon nitride based article including an interior body portion and a surface layer portion, said article comprising a major phase consisting essentially of silicon nitride and a minor phase consisting essentially of compounds of silicon, yttrium, nitrogen, and oxygen



wherein the atom ratio of yttrium to silicon in said minor phase of said surface layer portion of said article differs from the atom ratio of yttrium to silicon in said minor phase of said interior body portion of said article.

4,400,428

SEALABLE MULTILAYER FILMS

Heinrich Rosenthal; Ingo Schinkel, both of Walsrode; Günter Eger, Bomlitz, and Wolfgang Bair, Walsrode, all of Fed. Rep. of Germany, assignors to Wolff Walsrode Aktiengesellschaft, Walsrode, Fed. Rep. of Germany

Continuation-in-part of Ser. No. 313,022, Oct. 19, 1981. This application Apr. 5, 1982, Ser. No. 365,853

Claims priority, application Fed. Rep. of Germany, Apr. 8, 1981, 3114171

Int. Cl.³ C09J *7/02*

U.S. Cl. 428—349 **15 Claims**

1. A heat-sealable composite film comprising a biaxially oriented polypropylene film as a base film, said base film having two surfaces and, on at least one surface thereof is disposed, a layer combination which comprises

(A) a heat-sealable outer layer of polyethylene or of an ethylene copolymer containing at least 3% by weight of ethylene;

(B) an adhesion-promoting layer of modified polyolefin;

(C) gas-barrier layer of hydrolyzed ethylene/vinyl acetate copolymer containing from 50 to 80 mole percent of vinyl acetate units of which at least 90% are hydrolyzed;

(D) an adhesion-promoting layer of modified polyolefin; and

(E) a layer of polyethylene or of an ethylene copolymer containing at least 3% by weight of ethylene; each of the two layers A and B or D and E or layers B and C or C and D are combinable into one single layer by mixing the corresponding polymers; layer A containing an additive combination comprising

(a) from 0.3 to 1% by weight, based on the sealable layer, of a long-chain aliphatic amine,

(b) from 0.1 to 0.7% by weight, based on the sealable layer, of a dispersed thermoplastic polymer which is incompatible with the polyethylene or ethylene copolymer and which has a softening point at most 50° C. below or above the softening point of the polyethylene or ethylene copolymer, and

(c) from 0.1 to 1.2% by weight, based on the sealable layer, of a polydialkyl siloxane having a viscosity of between about 10^5 and 10^6 m.Pa.s at 20° C.

4,400,429

TREE RETARDANT ADDITIVE COMPOSITION FOR POLYMERIC INSULATION

Anthony Barlow, and Melvin F. Maringer, both of Cincinnati, Ohio, assignors to National Distillers and Chemical Corporation, New York, N.Y.

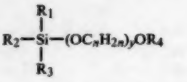
Continuation of Ser. No. 219,021, Dec. 22, 1980, abandoned. This application Jun. 30, 1982, Ser. No. 394,052

Int. Cl.³ B32B *15/00*; B05D *3/02*

U.S. Cl. 428—379 44 Claims

1. A polymeric composition having enhanced resistance to water treeing and electrical treeing consisting essentially of a homogeneous mixture of a solid synthetic organic polymeric thermoplastic resin and a water treeing and an electrical treeing inhibitor consisting essentially of

(1) a hydrocarboxyalkoxy silane having the formula:



wherein

R_1, R_2 and R_3 are the same or different and are $(OC_nH_{2n})_yOR_4$, C_1 to C_8 alkyl, C_1 to C_8 alkoxy, C_1 to C_8 acyloxy, C_2 to C_8 alkenyl, C_6 to C_{18} aryl or substituted aryl or C_6 to C_{18} aryloxy or substituted aryloxy,

R_4 is C_1 to C_8 alkyl or C_6 to C_{18} aryl or substituted aryl, and n is 1 to 8 and y is 1 to 5, and

(2) an unsubstituted or an aryl-substituted C_{10} to C_{20} fatty acid, said aryl substituent being a C_6 to C_{18} aryl or substituted aryl, said silane and fatty acid each being provided in an amount which when combined with the other provides a combined amount which is effective to inhibit water treeing and electrical treeing in said polymeric composition and which does not adversely affect the electrical insulating properties of said polymeric composition.

4,400,430

MAGNET WIRES

Masayoshi Miyake; Isao Ueoka, and Munetaka Kawaguchi, all of Nagoya, Japan, assignors to Sumitomo Electric Industries, Ltd., Osaka, Japan

Filed Jul. 26, 1982, Ser. No. 401,770

Claims priority, application Japan, Jul. 24, 1981, 56-116549

Int. Cl.³ B32B *27/00*

U.S. Cl. 428—383 7 Claims

1. A magnet wire, comprising:

an electrical conductor core; and

at least one outermost insulation layer surrounding the core, the layer being formed by applying and baking an enamel composition consisting essentially of a polyamide polymer at least one molecule of which is terminated with a straight chain alkyl group having 21 or more carbon atoms, the straight chain alkyl group being contained in the polyamide in an amount of 0.3 to 3.5% by weight.

4,400,431

MAGNESIUM ALUMINUM SPINELS

Walter W. Henslee, Lake Jackson; John S. Lindsey, Houston; Stanley J. Morrow, Clute, all of Tex.; John N. Periard, Bay City, Mich., and Charles R. Whitworth, Plymouth, Wis., assignors to The Dow Chemical Company, Midland, Mich.

Continuation-in-part of Ser. No. 184,189, Sep. 4, 1980, abandoned. This application Sep. 4, 1981, Ser. No. 299,430

Int. Cl.³ B32B *5/16, 9/04*; C01F *5/00, 7/02*

U.S. Cl. 428—402 25 Claims

1. A coprecipitate comprised of a substantially layered crystallite having the structure

$$\frac{M^{II}Y}{M^{I}X} = (1 + z)M^{I}X \cdot 2M^{II}Y$$

wherein M^I represents a cation of a metal or mixture of cations of metals having a valence of 1 or 2, and is selected from the group Li, Fe^{++}, Mg, Co^{++}, Ni and Zn; M^{II} represents a cation of a metal or mixture of cations of metals having a valence of 3 and is selected from the group consisting of Al, Fe^{+++}, Cr^{+++} and Co^{+++}; X and Y are anions having a valence of 1 or 2 selected from the group consisting of hydroxyl, halogen, sulfate, formate, hydrogen phosphate, acetate, nitrate, carbonate, bicarbonate or mixtures thereof comprized as haloacetate, hydroxycarbonate, chlorohydroxide; z equals or is greater than zero but less than 3, and sufficient segregated phase of $M^{II}.O.Y$ and/or $M^{II}Y$ to produce a stoichiometry of

$M^{I}X.2M^{II}Y$.

4,400,432

COATING IRON OXIDE PARTICLES FOR MAGNETIC RECORDING

Gunter Buxbaum, Krefeld; Ingo Pflugmacher, Meerbusch; Franz Hund, Krefeld; Volker Hahnkamm, Krefeld, and Peter Woditsch, Krefeld, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Division of Ser. No. 21,870, Mar. 19, 1979, Pat. No. 4,323,596. This application Sep. 24, 1981, Ser. No. 305,577

Claims priority, application Fed. Rep. of Germany, Apr. 12, 1978, 2815712

Int. Cl.³ B32B *5/16*; B22F *1/02*; G11B *5/62*; C01G *49/02*

U.S. Cl. 428—403 3 Claims

1. Needle-shaped ferrimagnetic iron oxide particles for magnetic signal recording, surface coated with at least two layers of which one contains oxygen-containing anions and the other polyvalent cations, the anions being selected from the group consisting of silicate, phosphate, borate, vanadate, molybdate and tungstate and the cations being selected from the group consis.ing of aluminum, chromium, manganese, iron and gallium.

4,400,433

PROCESS FOR THE PREPARATION OF MOLDING FLEXIBLE GRAPHITE GRANULES AND A MOLDED GRAPHITE PRODUCT PRODUCED THEREFROM

Jiro Ishiguro, Suita, and Kazuo Maruya, Fukui, both of Japan, assignors to Fukuvi Chemical Industry Co., Ltd., Fukui, Japan

Filed May 4, 1981, Ser. No. 260,172

Claims priority, application Japan, May 2, 1980, 55-57781; Sep. 8, 1980, 55-123507

Int. Cl.³ C01B *31/04*

U.S. Cl. 428—408 6 Claims

1. A molded graphite product produced by a process comprising:

immersing veriform expanded graphite masses having a bulk density of not more than 0.01 g/cc in a liquid which is inert to the graphite and capable of wetting at least the surfaces of the graphite masses, said liquid being employed in an amount of at least 25 times, by weight, that of the vermiform expanded graphite masses;

agitating the graphite masses in the liquid for a time sufficient for the graphite masses to undergo compression and density-increase and form graphite granules;

separating the graphite granules from the liquid;

drying the graphite granules; and

molding the dried graphite granules by pressing to have a density of 0.8 to 2.0 g/cc.

4,400,434
FLUOROELASTOMER COMPOSITE FRICTION MATERIAL

Muljadi Santoso, Hamden, and Michael A. DiPino, West Haven, both of Conn., assignors to Raymark Industries, Inc., Trumbull, Conn.

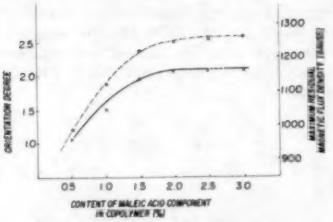
Filed Nov. 18, 1981, Ser. No. 322,643
Int. Cl.³ B32B *27/00, 5/16*
U.S. Cl. 428—421 9 Claims

1. An improved friction material of the type comprising a fluoroelastomer and reinforcing fibers and wherein the material is mounted on a rigid backing plate and brought into engagement with a reaction member, said friction material comprising the combination of a fluoroelastomer and carbonaceous fibers, wherein all of said reinforcing fibers present in said friction material are substantially unreactive with said fluoroelastomer at elevated temperatures, said friction material having a dynamic coefficient of friction of from about 0.06 to about 0.20 and a static coefficient of friction of from about 0.08 to about 0.30.

4,400,435
MAGNETIC RECORDING MEDIUM

Kunlichi Yoda; Takehisa Ohkawa, and Hitoshi Azegami, all of Tokyo, Japan, assignors to TDK Electronics Co., Ltd., Tokyo, Japan

Filed Jul. 15, 1981, Ser. No. 283,549
Claims priority, application Japan, Jul. 22, 1980, 55-99398
Int. Cl.³ G11B *5/68;* B32B *27/30, 27/40*
U.S. Cl. 428—425.9 6 Claims



1. A magnetic recording medium which comprises a substrate coated with a magnetic layer comprising a magnetic powder and a binder comprising an urethane resin and a vinyl chloride-vinyl acetate-maleic acid copolymer having a content of maleic acid component of at least 1.5%.

4,400,436
DIRECT ELECTROLESS DEPOSITION OF CUPROUS OXIDE FILMS

J. Shannon Breininger, Gibsonia, and Charles B. Greenberg, Murrysville, both of Pa., assignors to PPG Industries, Inc., Pittsburgh, Pa.

Continuation of Ser. No. 164,110, Jun. 30, 1980, Pat. No. 4,315,055, which is a continuation of Ser. No. 755,369, Dec. 29, 1976, abandoned. This application Feb. 27, 1981, Ser. No. 238,732
The portion of the term of this patent subsequent to Oct. 9, 1996, has been disclaimed.
Int. Cl.³ B32B *17/06;* C03C *17/36*
U.S. Cl. 428—434 9 Claims

1. A wet chemical method for the direct deposition of cuprous oxide onto a surface of a receptive substrate comprising the steps of:

(a) preparing an electroless plating solution comprising a copper salt and a reducing agent;

(b) adding to said solution sufficient alkali to bring the pH of the solution to at least about 12.9; and

(c) contacting the surface to be coated with the solution for sufficient time to deposit a film consisting essentially of cuprous oxide to a desired thickness.

4,400,437
THERMAL RECORDING PAPER

Yoshitaka Oeda, Ikoma, Japan, assignor to Kanzaki Paper Mfg. Co., Ltd., Tokyo, Japan

Filed Apr. 14, 1982, Ser. No. 368,418
Claims priority, application Japan, Apr. 14, 1981, 56-56544
Int. Cl.³ B32B *9/04*
U.S. Cl. 428—447 1 Claim

1. A thermal recording paper comprising a color generating layer containing a color former and a color developer that contacts the color former to generate a color formed on a paper support, wherein the back side of the paper is treated with an inorganic salt, an anionic high molecular weight electrolyte, an electroconductive metallic compound, alumina sol, or silica sol, and has a surface electrical resistivity of from 1×10^{9} to 1×10^{11} ohms at 25° C. and 40% RH.

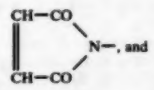
4,400,438
PROCESS FOR PRODUCING FIRE RETARDANT AND HEAT RESISTANT COPPER-CLAD LAMINATED BOARD, AND VARNISH THEREFOR

Akio Takahashi, Hitachiohta; Yutaka Itoh, Hitachi; Takeshi Shimazaki, Hitachi; Motoyo Wajima, Hitachi; Hirosada Morishita, Hitachi; Yutaka Mizuno, Shimodate; Shunya Yokozawa, Oyama, and Kenji Tsukanishi, Shimodate, all of Japan, assignors to Hitachi Chemical Company, Ltd., Tokyo, Japan

Filed Mar. 30, 1981, Ser. No. 249,242
Claims priority, application Japan, Mar. 31, 1980, 55-42405
Int. Cl.³ B32B *15/08, 31/12*
U.S. Cl. 428—458 3 Claims

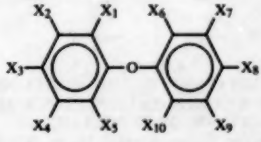
1. A process for producing a fire retardant and heat resistant copper-clad laminated board, which comprises the steps of:

(1) impregnating a base material with a varnish comprising a solvent, at least one maleimide compound and/or resin containing at least one maleimide group represented by the formula (I):



(I)

0.1 to 10% by weight, based on the resin content of the varnish, of at least one halogenated diphenyl ether compound containing at least eight halogen atoms and represented by the formula (II):



(II)

wherein X_1 to X_{10} each independently is a chlorine atom, a bromine atom, a hydrogen atom, a methyl group, an ethyl group, an n-propyl group, an iso-propyl group or an amino group;

(2) drying the impregnated base material to prepare a prepreg; and

(3) contact-bonding under heat and pressure a required number of sheets of the prepreg placed in contact relationship and one sheet of copper foil placed thereon or two sheets of copper foil sandwiching the same.

2. A copper-clad laminated board produced by a process according to claim 1.

4,400,439

RECORDING MEDIA

Takashi Kashiwagi, Tanashi, and Nobuyuki Inoue, Tokyo, both of Japan, assignors to Process Shizai Co., Ltd., Tokyo, Japan

Filed Feb. 9, 1981, Ser. No. 232,491

Claims priority, application Japan, Feb. 7, 1980, 55/13017; Dec. 9, 1980, 55/172643

Int. Cl.³ B32B *3/10*; G03C *5/00*

U.S. Cl. 428—478.2 **11 Claims**

1. A thermally-sensitive recording medium comprising a recording layer provided on a support, said recording layer containing at least one chemically modified thermally coagulatable proteinaceous compound containing therein no intermolecular cross-linking bond.

4,400,440

ELECTROSTATIC PAPER BASE AND ME HOD OF MAKING THE SAME

Michael J. Shaw, Paw Paw, Mich., assignor to Allied Paper Incorporated, Kalamazoo, Mich.

Filed Jan. 2, 1981, Ser. No. 222,014

Int. Cl.³ B32B *23/08, 27/10*; B05D *3/02, 3/10*

U.S. Cl. 428—511 **16 Claims**

1. A method for the preparation of a paper base suitable for electrostatic masters for lithographic printing comprising the steps of

(a) applying to at least one side of a paper substrate a thin coating of a barrier coating composition which comprises

(1) an aqueous medium,

(2) a film-forming amount of a synthetic, organic, polymeric, thermoplastic, water-resistant, film-forming resin which is solid at ordinary temperatures, and which has a glass transition temperature less than 115° C., said film forming resin also having labile hydrogen-containing groups reactive with an ammonium zirconyl complex,

(3) less than 35% by weight (dry basis) of inorganic particulate material,

(4) the ratio of resin to inorganic particulate material being at least 2:1;

(b) cross-linking the resin in said coating with an ammonium zirconyl complex;

(c) passing said paper through a dryer operating at a temperature such that the temperature of said paper substrate and coating is elevated above said resin glass transition temperature; and

(d) positioning said coated paper following drying in successive layers;

(e) said coating composition being rendered non-blocking by cross-linking with the ammonium zirconyl complex whereby fusion of the successive layers is obviated.

16. A paper base prepared according to the method of claim 1.

4,400,441

ELECTROGRAPHIC COATING CONTAINING AQUEOUS EMULSION COPOLYMERIZED ACRYLAMIDE COPOLYMERS

Ralph L. Minnis, Des Plaines; Frank J. Ragas, Willow Springs, and Gerson E. Beauchamp, Park Ridge, all of Ill., assignors to DeSoto, Inc., Des Plaines, Ill.

Continuation-in-part of Ser. No. 124,111, Feb. 25, 1980, Pat. No. 4,339,505. This application Jul. 23, 1981, Ser. No. 285,967

The portion of the term of this patent subsequent to Jul. 13, 1999, has been disclaimed.

Int. Cl.³ B32B *27/08*

U.S. Cl. 428—514 **10 Claims**

1. Electrically conductive paper coated with an insulating coating comprising an aqueous emulsion copolymer of monoethylenically unsaturated monomers comprising from 5% to 40% of copolymerized acrylamide or a monoethylenic derivative thereof.

4,400,442

FIBER REINFORCED ELECTROFORMED SUPERPLASTIC NICKEL-COBALT MATRICES

Jack R. Lewis, Granada Hills, and Robert J. Walter, Thousand Oaks, both of Calif., assignors to Rockwell International Corporation, El Segundo, Calif.

Filed Jul. 13, 1981, Ser. No. 282,563

Int. Cl.³ B32B *15/04*

U.S. Cl. 428—544 **28 Claims**

1. A fiber reinforced structure comprising at least one layer comprised of a plurality of reinforcing fibers contained in a matrix consisting essentially of an electroformed, superplastic, nickel-cobalt alloy.

17. A fiber reinforced structure comprised of a laminate of:

(a) at lease one layer of reinforcing fibers formed of fibers selected from the group consisting of carbon fibers and boron fibers;

(b) a first self-supporting layer consisting essentially of an electroformed, superplastic, nickel-cobalt alloy containing from about 35% to about 65% by weight cobalt, said first layer providing a first surface partially bonded to said reinforcing fibers and partially disposed between said reinforcing fibers;

(c) a second self-supporting layer consisting essentially of an electroformed, superplastic, nickel-cobalt alloy containing from about 35% to about 65% by weight cobalt, said second layer providing a second surface partially bonded to said reinforcing fibers and diffusion bonded to said first surface.

4,400,443

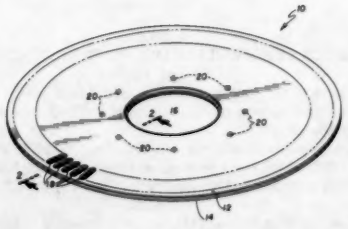
LAMINATED ENCODER DISC

Jeffrey W. Green, Hutchinson, Minn., assignor to Hutchinson Technology Incorporated, Hutchinson, Minn.

Filed Aug. 18, 1980, Ser. No. 178,929

Int. Cl.³ B22F *00/00*

U.S. Cl. 428—571 **24 Claims**



1. An improved encoder disc including code track means, the disc being comprised of at least two superimposed and united layers wherein one of the layers is thinner than the other and wherein the layers define a centered mounting hole, the size of the hole being more precisely defined by the thinner layer, the hole in the thicker layer being larger overall.

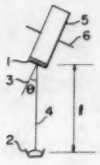
2. An improved encoder disc including code track means, the disc consisting of two superimposed and united stainless steel layers.

4,400,444

MAGNETIC RECORDING MEDIA AND PROCESS OF PRODUCING THEM

Toshiaki Izumi; Fumio Maruta; Takayoshi Kobuke, and Kiyoshi Noguchi, all of Tokyo, Japan, assignors to TDK Electronics Co., Ltd., Tokyo, Japan

Filed Jun. 3, 1982, Ser. No. 384,604
Claims priority, application Japan, Jun. 3, 1981, 56-84424
Int. Cl.³ H01F *10/02*
U.S. Cl. 428—694 3 Claims



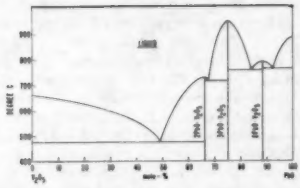
1. A magnetic recording medium comprising a non-magnetic web substrate having at least one ferromagnetic layer formed thereon characterized in that the residual magnetic flux density in the width direction of the web substrate (Br_t) is larger than the residual magnetic flux density in the lengthwise direction thereof (Br_l).

4,400,445

LIQUID PHASE EPITAXIAL GROWTH OF GARNET FILMS

George W. Berkstresser, Bridgewater, and Stuart L. Blank, Madison, both of N.J., assignors to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Continuation of Ser. No. 163,958, Jun. 30, 1980, abandoned. This application Nov. 18, 1981, Ser. No. 322,677
Int. Cl.³ C30B *19/02*
U.S. Cl. 428—700 6 Claims



1. Method for making a magnetic bubble device comprising a layer of a garnet material which is epitaxially deposited on a surface of a supporting substrate, said method comprising

(1) heating a preferred melt consisting essentially of said garnet material and a flux material at a temperature corresponding to supercooling of said garnet material, said flux material comprising PbO and V_2O_5, PbO being comprised in said flux material in an amount in the range of 67–99 molecular percent, and V_2O_5 being comprised in said flux material in an amount of at least 50 molecular percent of the molecular percent complementary to the molecular percent PbO,

(2) bringing at least said surface of said substrate in contact with said melt, and

(3) removing said substrate from contact with said melt upon deposition of said layer on said surface,

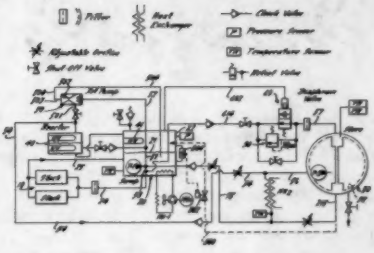
whereby said deposition is at a desired rate per degree C. of supercooling, said desired rate being less than or equal to 0.53 times a comparison rate, said comparison rate being the rate per degree C. of supercooling when said garnet material is deposited from a comparison melt, said comparison melt consisting essentially of a PbO-B_2O_3 flux and garnet constituent oxides, the B_2O_3:PbO molecular ratio in said comparison melt being 1:15.6, and the molecular ratio of yttrium oxide or its substituents versus iron oxide or its substituents being such that said garnet material is deposited from said comparison melt.

4,400,446

HALOGEN HYDRATE STORAGE DEVICE FOR MOBILE ZINC-CHLORIDE BATTERY SYSTEMS

Thomas H. Hacha, Troy, Mich., assignor to Energy Development Associates, Inc., Madison Heights, Mich.

Filed Mar. 12, 1982, Ser. No. 357,742
Int. Cl.³ H01M *8/18*
U.S. Cl. 429—19 10 Claims



1. In a metal halogen battery system, including at least one cell having a positive electrode and a negative electrode contacted by aqueous electrolyte containing the material of said metal and halogen, sump means for the electrolyte, store means whereby halogen hydrate is formed and stored as part of an aqueous material, means for circulating electrolyte through the cell and to the store means, and conduit means for transmitting halogen gas formed in the cell to a hydrate former whereby the hydrate is formed in association with the store means,

the improvement comprising,

said store means being constructed in the form of a container which includes a generally unitary filter means extending a. ound most of the inside surface of the container and with the filter means being spaced a predetermined distance away from said surface to form spacing between the filter means and said inside surface,

said filter means being operative to separate the hydrate formed from the liquid electrolyte,

a hydrate former-gas pump means associated with the store means and being operative to intermix halogen gas from the cell with aqueous electrolyte from the store means and from the cell,

a gas space means being maintained at the top of the store means with the hydrate former-pump means exhausting into the proximity of the gas space, said gas space means being operative to reduce transfer of liquid from the store to the cell,

exit conduit means generally adjacent the top of the store means for transmitting fluid containing halogen gas to the cell,

second exit conduit means generally adjacent the bottom of the store means for recirculating filtered electrolyte to the battery system.

4,400,447

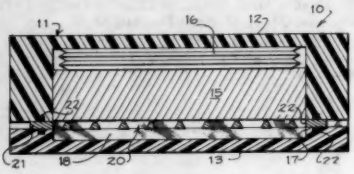
COMBINED CURRENT COLLECTOR AND ELECTRODE SEPARATOR

Robert J. Gerenser, Milpitas, and Ernest L. Littauer, Los Altos Hills, both of Calif., assignors to The Continental Group, Inc., Arlington, Va.

Filed Jun. 3, 1981, Ser. No. 270,114
Int. Cl.³ H01M *4/00, 2/14, 2/16, 2/18*
U.S. Cl. 429—27 11 Claims

1. In a reactive metal cell of the type including a cathode and

a consumable anode, a combined electrolyte side electrode current collector and electrode separator disposed between said cathode and said anode, the combined current collector and electrode separator comprising a backing in part forming a bus-bar, and a plurality of contacts projecting from one side of said backing in spaced relation and electrically coupled to said



backing, said contacts being in electrical contact with said anode and defining between said backing and said anode open areas for electrolyte flow substantially fully over said anode face, said contacts being in the form of needles which with the exception of tips thereof are coated with an electrical insulation resistive to electrolyte wherein exposed surface areas of said needles are held to a minimum.

4,400,448

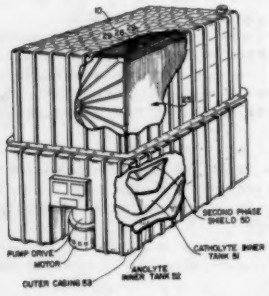
ELECTROCHEMICAL CONSTRUCTION

Harry Einstein, Springfield, and Patrick G. Grimes, Westfield, both of N.J., assignors to Exxon Research and Engineering Co., Florham Park, N.J.

Continuation of Ser. No. 268,666, Jun. 1, 1981. This application Apr. 30, 1982, Ser. No. 373,392

Int. Cl.³ H01M *2/02*

U.S. Cl. 429—34 **24 Claims**



1. A leak and impact resistant construction for a zinc-bromine electrochemical cell, comprising:

a series of leak-resistant compartments nested within each other, including:

a first inner compartment for storing a bromine-rich phase;

a second compartment substantially surrounding said first inner compartment and containing a first electrolyte for circulation through said cell;

a third compartment substantially surrounding both said second and first compartments and containing a second electrolyte for circulation through said cell; and

an outer casing substantially surrounding said first, second and third compartments.

4,400,449

LEAD SALT ELECTRIC STORAGE BATTERY

Peter O. Henk, Cedervej 14, Olstykke, Denmark DK-3650, assignor to Peter O. Henk, Olstykke and Peter Axel Fischer, Copenhagen, both of, Denmark

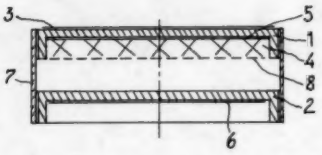
PCT No. PCT/DK81/00002, § 371 Date Aug. 21, 1981, § 102(e) Date Aug. 21, 1981, PCT Pub. No. WO81/02075, PCT Pub. Date Jul. 23, 1981

PCT Filed Jan. 9, 1981, Ser. No. 296,265

Claims priority, application Denmark, Jan. 10, 1980, 117/80

Int. Cl.³ H01M *10/06*

U.S. Cl. 429—59 **11 Claims**



1. Lead salt electric storage battery with electrodes of first order, having an active anode body comprising graphite, characterized by the combination of the following features:

(a) the active anode body consists of graphite fibers in textile structure,

(b) the active anode body is connected with an electrolyte-impervious, electrically conductive cell closure consisting of moulded articifial resin with moulded-in, uniformly distributed short graphite fibers,

(c) the connection between the active anode body and the cell closure is established through a uniting interface layer consisting of artificial resin with graphite fibers embedded therein,

(d) the electrolyte consists of a mixture of lead silicofluoride ($PbSiF_6$) and lead methane sulfonate ($Pb(CH_3SO_3)_2$) dissolved in water the proportion of lead silicofluoride ranging from 100 to 0%,

(e) the graphite fibers mentioned in paragraphs (a), (b) and (c), which have not been graphitized at a temperature of at least 2500° C., and the artificial resin materials with moulded-in short graphite fibers are such as are capable of withstanding a gas development test consisting of immersing a sample of the respective materials and a strip of lead in an acid aqueous solution of lead silicofluoride, connecting the sample to the positive terminal and the strip of lead to the negative terminal of a source of electric current, awaiting the deposition of a thin layer on the sample, inserting the sample thus prepared into a test tube from polystyrene filled with the same liquid as above, hermetically closing the test tube and storing it in inverted position, and watching that no trace of gas development takes place in said test tube within an observation interval up to four weeks.

4,400,450

BATTERY VENT

Franz M. Wagner, Lansdale, Pa., assignor to Allied Corporation, Toledo, Ohio

Filed Jul. 27, 1981, Ser. No. 286,795

Int. Cl.³ H01M *2/12*

U.S. Cl. 429—86 **8 Claims**

1. A vent plug for a storage battery, comprising:

a filling tube mounted to enter said battery with its inner end below the level of the electrolyte of said battery;

said filling tube being formed as a funnel at its outer end;

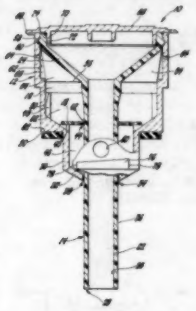
a shell portion surrounding a portion of said filling tube including said funnel;

said shell portion having a portion adapted to be sealably inserted in an opening in said battery, and including means for retaining said vent plug in said battery;

said shell portion defining a first chamber and a passage communicating between said first chamber and the interior space of said battery;

a baffle member disposed within said shell portion and defining a boundary between said first chamber and a second chamber, said shell portion defining said second chamber therein, said baffle member further defining a passage communicating between said first chamber and said second chamber;

a flame barrier member disposed within said shell portion;



said flame barrier member defining a boundary between said second chamber and a third chamber, said shell portion defining a third chamber therein;

said flame barrier member being substantially impervious to electrolyte of said battery, and allowing the flow of gases evolved from said battery therethrough;

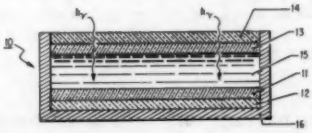
said shell portion defining a passage therethrough communicating between said third chamber and the atmosphere for allowing the passage of gas therethrough and forming means for limiting the evaporation of said electrolyte by preventing the circulation of air within said third chamber.

4,400,451

SOLAR ENERGY CONVERTER

Arnold Z. Gordon, Lyndhurst, Ohio, assignor to Diamond Shamrock Corporation, Dallas, Tex.

Filed May 4, 1981, Ser. No. 259,917
Int. Cl.³ H01M 6/36
U.S. Cl. 429—111 **30 Claims**



1. A liquid-junction photoelectrochemical semiconductor cell adapted for producing electricity, fuel, chemicals and/or chemical energy by use of light radiation comprising:

(I) a first electrode comprising: a bulk or film electrode comprising a photoactive true solid/solid solution semiconductor material having a band gap of approximately 1.4 eV and which, in the case of a film electrode, is disposed on a supporting electrically conductive substrate;

(II) a second electrode comprising: a semiconductive or conductive layer which is transparent to radiation of energy corresponding to the band gap of said first electrode (I), and which is disposed on a supporting conductive substrate, wherein said substrate also is transparent to radiation of energy corresponding to the band gap of component (I), further characterized in that said second electrode, if a semiconductor, is of opposite conductivity type in relation to said first electrode;

(III) an electrolyte disposed between, and in intimate contact with, both components (I) and (II);

(IV) a means for receiving the electrical energy produced;

wherein component (I) is further characterized in that said semiconductor material thereof is a photoactive true solid/solid solution mixed metal oxide semiconductor material derived from precursor substances selected from the group consisting of elemental metals, non-oxide metal compounds, and mixtures thereof; said phhotoactive true solid/solid solution mixed metal oxide semiconductor material corresponding to the formula $A_r^{va}M_y^{vm}O_z^{-2}$; where said formula represents the stoichiometry of the basic repeating unit lattice cell; where M is the combination of component (a) metal and component (b) metal; A when present is at least one different metal which does not substantially alter the optical absorption accruing from M in the above formula; O represents oxygen, said formula being further characterized in that r, y, z, va and vm are defined by the relationship va(r)+vm(y)=2z, wherein r equals a value of from 0 to 2, inclusive, y is from 1 to 2, inclusive, z is from 1 to 7, inclusive, va equals the positive valence of A, vm equals the positive mean valence of M, and the valence of oxygen is −2; and wherein all said metal components of said formula are selected from the group consisting of boron, aluminum, tin, lead, the transition metals of families 1b through 7b, inclusive, and 8 of the periodic table of elements, and the lanthanide series; wherein M in the above formula comprises:

(a) 50 to 99.9 mole percent, based on the total metals mole fraction, of one or more component (a) metals; and

(b) 0.1 to 50 mole percent, based on the total metals mole fraction, of one or more component (b) metals;

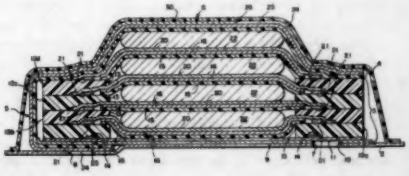
with the proviso that said component (b) metals are different than said component (a) metals and with the further proviso that said component (a) metals, when in comparable oxide form, have a larger band gap that said component (b) metals, when said component (b) metals are in their comparable oxide form; wherein said photoactive true solid/solid solution mixed metal oxide material's optical absorption edge is thereby optimized to approximately 1.4 eV.

4,400,452

LAMINAR ELECTRICAL CELLS AND BATTERIES

Alan H. Bruder, Burlington, Mass., assignor to Polaroid Corporation, Cambridge, Mass.

Filed Dec. 24, 1981, Ser. No. 334,375
Int. Cl.³ H01M 6/46
U.S. Cl. 429—152 **4 Claims**

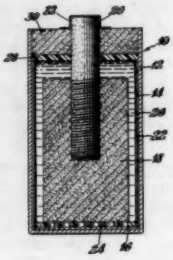


1. A battery of laminar series connected electrical cells, said cells each comprising a zinc anode, a manganese dioxide cathode, and an electrolyte comprising an aqueous solution of NH_4Cl and $ZnCl_2$ containing from 18 to 22 percent NH_4Cl and from 25 to 40 percent $ZnCl_2$ by weight based on the weight of solution.

4,400,453
NON-AQUEOUS ELECTROCHEMICAL CELL

George E. Blomgren, Lakewood, and Marvin L. Kronenberg, Cleveland Heights, both of Ohio, assignors to Union Carbide Corporation, Danbury, Conn.

Continuation-in-part of Ser. No. 212,582, Dec. 27, 1971. This application Feb. 4, 1974, Ser. No. 439,521
Int. Cl.[3] H01M *6/14*
U.S. Cl. 429—196 44 Claims

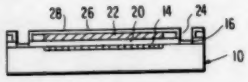


1. A non-aqueous electrochemical cell comprising an anode, a cathode collector and a cathode-electrolyte, said cathode-electrolyte consisting of an ionically conductive solution of a salt dissolved in an active cathode depolarizer wherein the sole active cathode depolarizer is a liquid oxyhalide of an element of Group V or Group VI of the Periodic Table or mixtures thereof.

4,400,454
PROCESS OF PRODUCING COLOR SOLID IMAGE PICKUP ELEMENT BASE PLATES

Masamichi Sato; Eiichi Hasegawa, and Koji Shimanuki, all of Asaka, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed Jul. 16, 1982, Ser. No. 399,090
Claims priority, application Japan, Jul. 16, 1981, 56-111367
Int. Cl.[3] G03F *5/00*
U.S. Cl. 430—7 12 Claims



1. A process of producing a color solid image pickup element base plate comprising the steps of:

coating a solvent permeation preventing layer formed on the surface of a solid image pickup element base plate with a silver halide emulsion layer,

removing the silver halide emulsion layer at portions corresponding to bonding pat portions of the solid image pickup element base plate to reveal the solvent permeation preventing layer at the portions,

forming a micro color filter composed of at least two-color color separation filter elements corresponding to each image element of the solid image pickup element base plate by repeatedly applying an image exposure and a color development to the remaining silver halide emulsion layer for each color,

forming a protective layer on the whole surface of the solid image pickup element base plate having the micro color filter thus formed thereon, and

removing the protective layer and the solvent permeation preventing layer at the portions corresponding to the bonding pat portions of the solid image pickup element base plate to reveal the bonding pat portions.

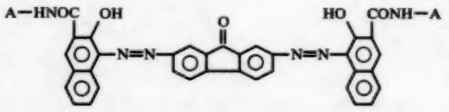
4,400,455
LAYERED ORGANIC ELECTROPHOTOGRAPHIC PHOTOCONDUCTOR ELEMENT COMPRISING BISAZO GENERATING AND HYDRAZONE TRANSPORT LAYERS

Mitsuru Hashimoto; Kiyoshi Sakai, both of Numazu; Katsunari Ohta, Mishima, and Akio Kojima, Hiratsuka, all of Japan, assignors to Ricoh Company Ltd., Tokyo, Japan

Filed Nov. 30, 1981, Ser. No. 325,900
Claims priority, application Japan, Dec. 10, 1980, 55-174002; Dec. 10, 1980, 55-174003; Dec. 10, 1980, 55-174004; Dec. 10, 1980, 55-174005; Dec. 10, 1980, 55-174006; Dec. 10, 1980, 55-174007; Dec. 10, 1980, 55-174008; Dec. 15, 1980, 55-176921
Int. Cl.[3] G03G *5/06*
U.S. Cl. 430—59 10 Claims

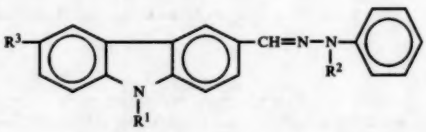
1. In a layered electrophotographic photoconductor comprising an electroconductive support material and a photoconductive double layer which consists of a charge generation layer and a charge transport layer, the improvement wherein:

a. said charge generation layer comprises a charge generating material selected from the group consisting of bisazo pigments of the formula



wherein A represents —C_6H_4—Cl(o), —C_6H_4—Cl(m), —C_6H_4—Br(o), —C_6H_4—Br(m), —C_6H_4—F(o), —C_6H_4—F(m), —C_6H_4—F(p), or —C_6H_4—I(m); and

b. said charge transport layer comprises a charge transporting material selected from the group consisting of the hydrazone compounds of the formula



wherein R^1 represents a methyl group, an ethyl group, a 2-hydroxyethyl group or a 2-chloroethyl group; R^2 represents a methyl group, an ethyl group, a benzyl group or a phenyl group; and R^3 represents hydrogen, chloride, bromide, an alkyl group with one to four carbon atoms, an alkoxy group with one to four carbon atoms, a dialkylamino group, or a nitro group.

4,400,456
THERMO-DEVELOPABLE TYPE DIAZO COPYING MATERIAL

Tsutomu Matsuda, Shizuoka, and Shigeru Kusakata, Susono, both of Japan, assignors to Ricoh Co., Ltd., Tokyo, Japan

Filed Aug. 21, 1981, Ser. No. 295,036
Claims priority, application Japan, Aug. 29, 1980, 55-118279
Int. Cl.[3] G03C *1/60, 1/58*
U.S. Cl. 430—138 7 Claims

1. A thermally developable, diazo-type, copying material comprising a substrate and a photosensitive layer formed on said substrate, said photosensitive layer consisting essentially of a diazonium compound suitable for use in a two component diazotype copying material, an azo coupling component and a color assistant, wherein said color assistant is at least one member selected from the group consisting of fatty acid amides having the formula:

R^1CONH_2

wherein R^1 is a saturated or unsaturated aliphatic hydrocarbon group having 5 to 24 carbon atoms,

N-substituted fatty acid amides having the formula:

R^1CONHR^2

wherein R^1 is the same as defined above and R^2 is an alkyl group having 1 to 5 carbon atoms, phenyl, substituted phenyl, cyclohexyl or substituted cyclohexyl,

and N-substituted fatty acid amides having the formula:

R^1NHCOR^2

wherein R^1 and R^2 are the same as defined above respectively;

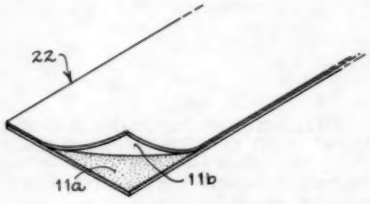
and wherein said coupling component is in the form of fine particles encapsulated with an encapsulating material to form capsules, said encapsulating material being selected from the group consisting of non-polar wax-like substances having a melting point in the range of 50° to 150° C. and hydrophobic vinyl resins having a softening point in the range of 50° to 150° C.

4,400,457

DUAL LAYER RECORD ELEMENT AND METHOD

Reynold B. Johnson, 548 E. Cresent Dr., Palo Alto, Calif. 94301

Filed Nov. 19, 1981, Ser. No. 322,758
Int. Cl.³ G03C *5/14*
U.S. Cl. 430—140 **5 Claims**



1. A record element comprising a maximum of two layers of matter, one layer being formed from a mixture of magnetic and resin materials to provide a self-supporting layer, and a second layer forming a coating of photoresponsive chemical material applied to one side of said one layer, said mixture including sufficient magnetic material to cause said one layer to be sufficiently opaque to prevent exposure of said coating to light passing through said layer so as to permit said element to record information thereon both photographically and magnetically.

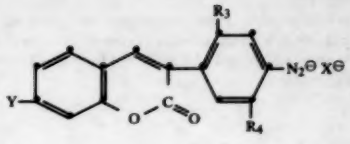
4,400,458

DIAZONIUM SALTS AND A DIAZO-TYPE MATERIAL COMPRISING THESE DIAZONIUM SALTS

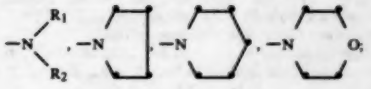
Fred Walkow, Wolfen; Peter Czerney, Weimar; Horst Hartmann, Dresden, and Jörg Marx, Dessau, all of German Democratic Rep., assignors to VEB Filmfabrik Wolfen, Wolfen, German Democratic Rep.

Filed Sep. 14, 1981, Ser. No. 302,286
Claims priority, application German Democratic Rep., Dec. 15, 1980, 226068
Int. Cl.³ G03C *1/54*; C07C *113/04*
U.S. Cl. 430—157 **22 Claims**

1. A light-sensitive diazonium salt of the general formula

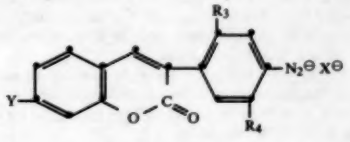


wherein
Y is

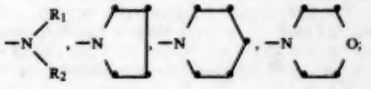


R_1, R_2 are equal or different, and are alkyl having 1 to 10 carbon atoms, aryl having 6 to 10 carbon atoms in a mono or polycyclic ring;
R_3 is hydrogen, halogen, alkyl, alkoxy, cyano;
R_4 is hydrogen, halogen, alkyl, alkoxy; and
$x^\ominus$ is an anion.

2. A diazo-type material, comprising a diazonium salt in the light-sensitive layer of the general formula



wherein
Y is



R_1, R_2 are equal or different, and are alkyl having 1 to 10 carbon atoms, aryl having 6 to 10 carbon atoms in a mono or polycyclic ring;
R_3 is hydrogen, halogen, alkyl, alkoxy, cyano;
R_4 is hydrogen, halogen, alkyl, alkoxy; and
$X^\ominus$ is an anion.

4,400,459

PROCESS FOR BROMINE SURFACE TREATMENT OF PHOTOSENSITIVE ELASTOMERIC FLEXOGRAPHIC PRINTING PLATES

Robert R. Gruetzmacher, Chadds Ford, Pa.; Stanley H. Munger, Rumson, and Peter F. Warfield, Westfield, both of N.J., assignors to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Continuation-in-part of Ser. No. 261,293, May 7, 1981, abandoned. This application May 7, 1982, Ser. No. 375,975
Int. Cl.³ G03C *5/00*
U.S. Cl. 430—306 **11 Claims**

1. A process for modifying the surfaces of relief flexographic printing plates wherein the reliefs are prepared by imagewise exposure with actinic radiation and liquid development of the unexposed areas of a layer of a photosensitive, elastomeric composition comprising a polymer of a conjugated diolefin hydrocarbon and a nongaseous ethylenically unsaturated compound containing at least one terminal ethylenic group, the

improvement, wherein after drying, the developed surface is, in either order,

(1) postexposed to a source of actinic radiation, and

(2) contacted with an aqueous treatment solution of an alkali monopersulfate and a bromide salt for about 15 seconds to 40 minutes.

4,400,460

PROCESS FOR SURFACE TREATMENT OF FLEXOGRAPHIC PRINTING PLATES CONTAINING BUTADIENE/ACRYLONITRILE COPOLYMERS

Michael G. Fickes, Colts Neck, and Bohdan Rakoczy, East Brunswick, both of N.J., assignors to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Continuation-in-part of Ser. No. 261,294, May 7, 1981, abandoned. This application May 7, 1982, Ser. No. 375,976

Int. Cl.³ G03C *5/00*

U.S. Cl. 430—306 **5 Claims**

1. A process for providing improved solvent resistant surfaces of relief flexographic printing plates wherein the reliefs are prepared by imagewise exposure with actinic radiation and liquid development of the unexposed areas of a layer of a photosensitive, elastomeric composition comprising a high molecular weight butadiene/acrylonitrile copolymer having a number average molecular weight of 20,000 to 75,000, an acrylonitrile content of 10 to 50% by weight and a carboxyl content of 0 to 15% by weight and a nongaseous ethylenically unsaturated compound containing at least one terminal ethylenic group, the improvement, wherein after drying, the developed surface is, in either order,

(1) postexposed to a source of actinic radiation, and

(2) contacted with an aqueous solution having a free bromine concentration of 0.01 to 3.5% by weight for about 15 seconds to 20 minutes.

4,400,461

PROCESS OF MAKING SEMICONDUCTOR DEVICES USING PHOTOSENSITIVE BODIES

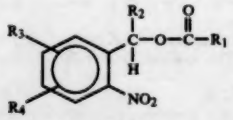
Edwin A. Chandross, Berkeley Heights; Elsa Reichmanis, Piscataway, and Cletus W. Wilkins, Jr., Plainfield, all of N.J., assignors to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed May 22, 1981, Ser. No. 265,554

Int. Cl.³ G03C *5/00*

U.S. Cl. 430—311 **11 Claims**

1. A process for preparing a semiconductor device comprising the steps of depositing a photosensitive material on a substrate comprising a semiconductor material, irradiating said photosensitive material with electromagnetic radiation in a desired pattern, developing said pattern with an alkaline solution, and completing the fabrication of said semiconductor device wherein said photosensitive material comprises a mixture of an o-nitroarylmethyl ester of a carboxylic acid and a polymer which is soluble in said alkaline solution, said o-nitroarylmethyl ester being represented by the formula



where R_1 is a substituent chosen so that a salt of the carboxylic acid, R_1COOH, is sufficiently soluble in water to produce at least a 0.01 M solution and R_1, R_2, R_3, and R_4 are chosen so that the ratio expressed as 1:n of the solubility rate of said unexposed to said exposed portions is such that n is at least 4.

4,400,462

METHOD FOR THE FORMATION OF PHOTOGRAPHIC IMAGES

Kouzi Ono; Mikio Kawasaki; Mariko Natori, and Eiichi Sakamoto, all of Hino, Japan, assignors to Konishiroku Photo Industry Co., Ltd., Tokyo, Japan

Filed Jun. 1, 1981, Ser. No. 268,776

Claims priority, application Japan, Jun. 11, 1980, 55-79379

Int. Cl.³ G03C *5/24*

U.S. Cl. 430—415 **10 Claims**

1. A method for the formation of a negative photographic image comprising

(a) imagewise exposing a silver halide photographic light sensitive material and

(b) developing said material with a processing solution containing at least a developing agent for silver halide and an agent for dissolving metallic salt particles

in which said photographic material has a support and at least one layer coated on one side having

(a) light sensitive silver halide particles,

(b) metallic salt particles which are substantially non-light sensitive and which are soluble in said processing solution, said metallic salt particles having been modified on the surface thereof with metallic salt solubility reducing agent, such that in its presence the solubility of the metallic salt at its surface is reduced below the metallic salt solubility in the absence of said solubility reducing agent and

(c) internally fogged silver halide particles which are substantially non-light sensitive,

and wherein said metallic salt particles are silver halide.

4,400,463

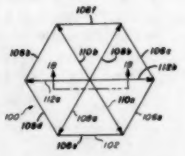
SILVER CHLORIDE EMULSIONS OF MODIFIED CRYSTAL HABIT AND PROCESSES FOR THEIR PREPARATION

Joe E. Maskasky, Rochester, N.Y., assignor to Eastman Kodak Company, Rochester, N.Y.

Continuation-in-part of Ser. No. 320,898, Nov. 12, 1981, abandoned. This application Sep. 30, 1982, Ser. No. 431,455

Int. Cl.³ G03C *5/26, 1/76, 1/02*

U.S. Cl. 430—434 **30 Claims**



1. In a process of preparing a radiation-sensitive photographic emulsion wherein aqueous silver and chloride-containing halide salt solutions are brought into contact in the presence of a dispersing medium to form tabular silver halide grains, the halide content of which is at least 50 mole percent chloride, based on silver,

the improvement comprising reacting said aqueous silver and chloride-containing halide salt solutions in the presence of a crystal habit modifying amount of an aminoazaindene and a peptizer having a thioether linkage.

4,400,464

METHOD AND AGENT FOR THE STABILIZATION OF ALKALINE PHOSPHATASE

Rolf Vormbrock, and Roland Helger, both of Darmstadt, Del.X, assignors to Merck Patent Gesellschaft mit beschränkter Haftung, Darmstadt, Fed. Rep. of Germany

Filed Jun. 22, 1981, Ser. No. 276,399

Claims priority, application Fed. Rep. of Germany, Jun. 24, 1980, 3023485

Int. Cl.³ C12N 9/96; C12Q 1/42

U.S. Cl. 435—21 9 Claims

1. In an aminoalcohol-containing buffer solution reagent for use in the determination of the alkaline phosphatase present in a test sample brought into contact with the buffer solution, the improvement wherein the aminoalcohol-containing buffer solution further comprises the products of the addition thereto of an amount of a water-soluble zinc chelate complex effective to stabilize the alkaline phosphatase when the buffer solution is contacted with the test sample.

4,400,465

SEMI-SYNTHESIS OF HUMAN INSULIN

Kazuyuki Morihara; Tatsushi Oka, both of Osaka, and Hiroshige Tsuzuki, Hirakata, all of Japan, assignors to Shionogi & Co., Ltd., Osaka, Japan

Division of Ser. No. 138,514, Apr. 9, 1980, Pat. No. 4,320,196. This application Dec. 31, 1981, Ser. No. 336,071

Claims priority, application Japan, Apr. 13, 1979, 54-45710

The portion of the term of this patent subsequent to Mar. 16, 1999, has been disclaimed.

Int. Cl.³ C12P 21/04; C12R 1/025, 1/465, 1/54

U.S. Cl. 435—71 20 Claims

1. A process for preparing a B30-threonine-insulin which comprises converting an animal insulin to a des-B30-insulin, reacting the des-B30-insulin with a threonine derivative of the formula.

$$Thr(R^1)(R^2)$$

wherein Thr is an L-threonine residue, R^1 is hydrogen or a hydroxy-protecting group and R^2 is a carboxyl-protecting group, in a molar ratio of the threonine derivative to the des-30-insulin of 5:1 to 1000:1, and in the presence of an enzyme specifically acting on the basic-amino-acid carbonyl in peptide bondings selected from the group consisting of trypsin, a trypsin-like enzyme produced by *Streptomyces fradiae* ATCC 3535 and a trypsin-like enzyme produced by *Streptomyces erythreus*, and subjecting the resultant product to one or more reactions to remove all of the protecting groups.

4,400,466

PROCESS FOR THE PREPARATION OF VISCOUS WATER BY ACTION OF MICRO-ORGANISMS

Edgard E. Y. Azoulay, Marseilles, France, assignor to Dumas & Inchauspe, Pau, France

Filed Oct. 16, 1981, Ser. No. 312,165

Claims priority, application France, Oct. 17, 1980, 80 22210

Int. Cl.³ C12P 19/04; C12R 1/41

U.S. Cl. 435—101 8 Claims

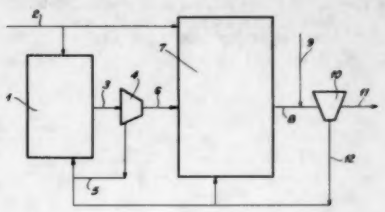
1. Process for continously preparing viscous water by bacterial action, which process comprises the following steps:

(a) introducing into a first chamber containing a bacterial strain capable of excreting polysaccharides having viscosity increasing properties chosen from the genus Rhizobium, a carbohydrate substrate, nitrogeneous material in the form of mineral salts, and growth factors;

(b) collecting from the outlet of the said first chamber an aqueous product separating the bacteria from the aqueous product;

(c) introducing into a second chamber, by a first inlet, the bacteria recovered from step (b), and, by a second inlet, a carbohydrate substrate providing the raw material for synthesis of the polysaccharides; and

(d) collecting from the outlet of said second chamber a viscous product at a rate approximately equal to that of



the carbohydrate substrate at the inlet of the said second chamber.

4,400,467

PROCESS OF USING XANTHOMONAS CAMPESTRIS NRRL B-12075 AND NRRL B-12074 FOR MAKING HETEROPOLYSACCHARIDE

Keith A. Bauer, Los Altos, and Behzad Khosrovi, El Cerrito, both of Calif., assignors to Standard Oil Company (Indiana), Chicago, Ill.

Continuation of Ser. No. 167,892, Jul. 14, 1980, abandoned. This application Apr. 7, 1981, Ser. No. 251,831

Int. Cl.³ C12P 19/06; C12N 1/20; C12R 1/64

U.S. Cl. 435—104 17 Claims

1. A method for the production of a heteropolysaccharide by means of continuous fermentation which comprises inoculating a liquid carbohydrate minimal medium with a degenerative resistant strain of *Xanthomonas campestris* selected from the group consisting of *Xanthomonas campestris* L3 and *Xanthomonas campestris* L5, having the identifying characteristics of NRRL B-12074 and NRRL B-12075, respectively, cultivating said strain in said medium without discontinuing the fermentation process, withdrawing the results fermented medium therefrom at a rate such that an essentially steady state condition is maintained and recoverying heteropolysaccharide from said fermented medium.

4,400,468

PROCESS FOR PRODUCING ADIPIC ACID FROM BIOMASS

Marcel Faber, Princeton, N.J., assignor to Hydrocarbon Research Inc., Lawrenceville, N.J.

Filed Oct. 5, 1981, Ser. No. 308,336

Int. Cl.³ C12P 7/44; C12R 1/025, 1/425, 1/645, 1/685, 1/64

U.S. Cl. 435—142 12 Claims

1. A process for producing adipic acid from biomass, a renewable resource, said process comprising:

(a) hydrolyzing biomass with sufficient steam and dilute acid to provide 5-hydroxymethylfurfural;

(b) hydrogenating said 5-hydroxymethylfurfural in the presence of a catalyst to provide 2,5-tetrahydrofurandiomethanol;

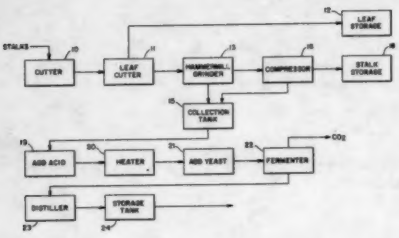
(c) treating said 2,5-tetrahydrofurandiomethanol with hydrogen under pressure of at least about 1,000 psi and in the presence of a catalyst at a temperature of from about 200° to about 350° C. to provide 1, 6 hexanediol; and

(d) oxydizing said 1, 6 hexanediol in the presence of a microorganism to provide adipic acid.

4,400,469
PRODUCTION OF ETHANOL FROM JERUSALEM ARTICHOKES

Fritz B. Harris, 590 Payne Rd., San Juan Bautista, Calif. 95045

Filed Jun. 15, 1981, Ser. No. 273,365
Int. Cl.³ C12P 7/06; A23K 1/00
U.S. Cl. 435—161 8 Claims



1. The method of producing ethanol which comprises the steps of

cutting the stalks of Jerusalem Artichokes above the tubers shortly before flowering,

grinding the cut stalks to release the sugar juices therefrom, fermenting the sugar juices, and

distilling the fermented liquid.

4,400,470
USE OF CO-CULTURES IN THE PRODUCTION OF ETHANOL BY THE FERMENTATION OF BIOMASS

Joseph G. Zeikus, Madison, Wis.; Thomas K. Ng, Arvada, Colo.; Arie Ben-Bassat, Richmond, Calif., and Raphael J. Lamed, Rehovot, Israel, assignors to Wisconsin Alumni Research Foundation, Madison, Wis.

Filed Jan. 14, 1981, Ser. No. 225,093
Int. Cl.³ C12P 7/14, 7/08, 7/10; C12R 1/145
U.S. Cl. 435—162 5 Claims

1. In the method of producing ethanol and enzymes as a by-product of ethanol production by the fermentation of biomass, the improvement comprising subjecting the biomass which includes cellulose and hemi-cellulose containing plant materials to fermentation under thermophilic conditions in the presence of co-cultures of *Clostridium thermocellum* and *Clostridium thermohydrosulfuricum*, the ratio of the cultures being in an amount whereby the conversion ratios of cellulose:ethanol and hemi-cellulose:ethanol are greater than the ratios obtained by use of either Clostridium species alone.

4,400,471
PREPARATION AND CRYSTALLIZATION OF FRACTION I PROTEIN FROM PLANT SOURCES

Sarjit S. Johal, 1411 S. 11th St., Lincoln, Nebr. 68502

Continuation-in-part of Ser. No. 203,779, Nov. 3, 1980, Pat. No. 4,334,024. This application Oct. 19, 1981, Ser. No. 312,194
The portion of the term of this patent subsequent to Jun. 8, 1999, has been disclaimed.
Int. Cl.³ C12N 9/88
U.S. Cl. 435—232 14 Claims

10. A method for preparing ribulose 1,5-bisphosphate carboxylase (RuBisCO) from plant material, said method comprising:

comminuting the plant material in an aqueous solution to form a suspension;

fractionating said suspension to release the RuBisCO and proteinaceous contaminants from the comminuted plant material into the solution;

separating the remaining plant material from the solution to form a supernatant including the RuBisCO and at least some of said dissolved contaminants;

passing the supernatant through an anionic resin bed in the presence of a divalent metal ion at a concentration selected so that substantially all of the contaminants bind to resin while the RuBisCO is prevented from binding to said resin.

4,400,472
NOVEL RABIES VIRUS STRAIN AND A PROCESS FOR ITS PREPARATION

Gosse Bijlenga, St. Didier au Mont d'Or, France, assignor to Gist-Brocades N.V., Delft, Netherlands

Division of Ser. No. 872,056, Jan. 25, 1978, Pat. No. 4,320,115. This application Oct. 13, 1981, Ser. No. 310,447
Claims priority, application United Kingdom, Jan. 26, 1977, 3258/77
Int. Cl.³ C12N 7/00, 7/08
U.S. Cl. 435—235 3 Claims

1. A rabies virus strain exhibiting reproducibly significant cytopathic effect on in vitro cell cultures of primary or secondary SPF chicken embryo fibroblasts of strain No. 675 deposited with the Czechoslovak National Collection of Type Culture of the Institute of Hygiene and Epidemiology in Prague deposited under CNCTC AO 4/77.

2. A process for the preparation of live rabies virus of claim 1 exhibiting reproducibly significant cytopathic effect of strain No. 675 deposited with the Czechoslovak National Collection of Type Culture of the Institute of Hygiene and Epidemiology in Prague comprising propagating HEP Flury virus in primary or secondary SPF chicken embryo fibroblasts, or in rabies susceptible cell lines and dipolid cell strains isolating a plaque therefrom which is distinguishable from the parent strain by its very pronounced cytopathic effect on the infected cell by use of a plaque assay method and a plaquing cell suspension method, and effecting three clone purifications of the obtained plaque to obtain the desired homogeneous and pure virus population.

4,400,473
ACIDPROOF, HYDROLYSIS-RESISTANT OPTICAL AND OPHATHALMIC GLASS OF LOW DENSITY

Karl Mennemann, Taunusstein; Georg Gliemeroth, and Volkmar Geller, both of Mainz, all of Fed. Rep. of Germany, assignors to Schott Glaswerke, Mainz, Fed. Rep. of Germany

Continuation-in-part of Ser. No. 282,787, Jul. 13, 1981. This application Jun. 2, 1982, Ser. No. 384,462
Claims priority, application Fed. Rep. of Germany, Jul. 14, 1980, 3026605; Jun. 2, 1981, 3121824
The portion of the term of this patent subsequent to Jun. 28, 2000, has been disclaimed.
Int. Cl.³ C03C 3/08, 3/10
U.S. Cl. 501—77 6 Claims

1. An optical and ophthalmic glass having n_d 22 1.69, $\nu_d \geqq 38$, a density $\geqq 3.25$ g/cm³, an expansion coefficient $\alpha_{20°-300°}$ C. of (80–97)·10⁻⁷, a high acid and hydrolysis resistance and sufficient stability for continuous-tank manufacture,

consisting essentially of, in wt. %,

4,400,474
BASIC REFRACTORY CEMENTITIOUS MATERIAL AND COMPONENTS THEREOF

Martin Copperthwaite, Westfield, and Michael A. Roberts, Totley, both of England, assignors to USS Engineers & Consultants, Inc., Pittsburgh, Pa.

Filed Apr. 26, 1982, Ser. No. 371,864
Int. Cl.³ C04B 35/04
U.S. Cl. 501—119 29 Claims

1. An hydraulic refractory cementitious formulation consisting essentially of:

70 to 86% of a magnesia component containing at least 94% MgO,

5 to 15% of an alumina component containing at least 98% Al_2O_3,

9 to 15% of an aluminous cement component containing at least 45% Al_2O_3,

said formulation after wetting being capable of hydraulically setting at room temperature.

4,400,475

POLYURETHANE FOAMS AND PROCESSES FOR PREPARATION

Richard B. Kennedy, Ridgefield, Conn., assignor to Patrick James Crehan and Richard J. Fricke, both of Ridgefield, Conn.

Continuation-in-part of Ser. No. 328,686, Dec. 8, 1981. This application Nov. 23, 1982, Ser. No. 443,878

Int. Cl.³ C08L 1/00; C08J 9/00

U.S. Cl. 521—103 39 Claims

1. A low reactive pressure flame-retardant polyurethane foam made by reacting together a reaction mixture consisting essentially of polyisocyanate, a surfactant, a polyurethane producing catalyst, and an aqueous solution or slurry of an untreated carbohydrate in which substantially all of the hydroxyl groups are free, and a flame retardant.

4,400,476

PAINT ADHESION FOR RIM PARTS

Ibrahim S. Bechara, Boothwyn, and Rocco L. Mascioli, Media, both of Pa., assignors to Air Products and Chemicals, Inc., Allentown, Pa.

Filed Mar. 15, 1982, Ser. No. 358,402

Int. Cl.³ C08G 18/14, 18/24; B29D 9/00

U.S. Cl. 521—107 6 Claims

1. An elastomeric composition for the production of RIM polyurethane products comprising per hundred parts of polyether polyol therein:

10 to 50 parts of a diol chain extender;

50 to 300 parts polyisocyanate;

0 to 4 parts of volatile fluorocarbon blowing agent,

0.1 to 1.0 parts of tertiary amine catalyst; and 0 to 0.2 parts of organo tin catalyst; together with 0.1 to 3 parts of a reactive organic halogen compound.

4,400,477

COPOLYESTER POLYOL RESINS, FOAMABLE BLENDS COMPRISING THE SAME, AND RESULTANT POLYISOCYANURATE FOAMS

Robert H. Blanpied, 10122 Cherry Tree Dr., Dallas, Tex. 75243

Filed Feb. 17, 1982, Ser. No. 349,607

Int. Cl.³ C08G 18/14

U.S. Cl. 521—112 20 Claims

1. A hydroxyl terminated copolyester polyol resin having a functionality between about 2 and about 3 comprising the reaction product of:

(i) an aromatic component selected from phthalic anhydride; phthalic acid isomers; di-lower alkanol esters of phthalic acids; di-, and tri-carbomethoxy substituted diphenyls, benzyl esters, toluenes, benzenes, or benzophenones; or mixtures thereof, and

(ii) at least one aliphatic component selected from succinic, glutaric, or adipic acids, esters, anhydrides, or mixtures thereof,

(iii) at least one primary hydroxyl glycol, and

(iv) at least one secondary hydroxyl glycol; the mole ratios of the components being:

(i) glycols to aromatic plus aliphatic component of from about 1.3 to 2:1,

(ii) aliphatic component to aromatic component of from about 0.3 to 1.7:1, and

(iii) primary glycol to secondary glycol being from about 0.6 to 2.5:1, where the charged mole ratios are the same as the final mole ratios since no removal of glycols is made during the reaction.

4,400,478

MOLDING COMPOUNDS COMPRISING A MIXTURE OF BLOCK COPOLYMERS EMPLOYED AS A MODIFIER FOR THERMOSETTING UNSATURATED POLYESTER RESIN COMPOSITIONS

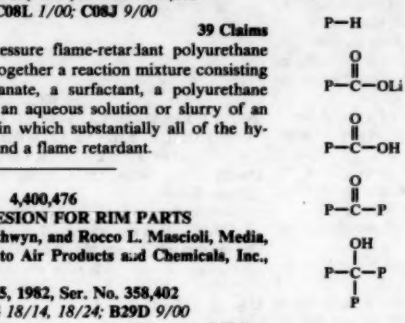
William P. Gergen, and Walter M. Halper, both of Houston, Tex., assignors to Shell Oil Company, Houston, Tex.

Filed Dec. 23, 1982, Ser. No. 452,589

Int. Cl.³ C08K 3/26; C08L 67/06, 53/02, 53/00

U.S. Cl. 523—514 19 Claims

1. A molding compound modifier combination comprising (a) between about 10 and 90% w of a normally solid, carboxy-containing polymer comprising the mixture of structures



(I)

(II)

(III)

(IV)

(V)

where P- is a styrene-butadiene block copolymer with the butadiene portion having a microstructure of between about 30 and about 40 mol percent 1,2-vinyl, between about 20 and about 30 mol percent 1,4-cis and between about 30 and about 50 mol percent 1,4-trans and (b) between 90 and 10% w of a block copolymer having the general formula

$$(A—B)_n$$

wherein A is a block of the group consisting of polystyrene polymer blocks and hydrogenation products thereof having an average molecular weight between about 5,000 and 50,000, B is a polymer block of the group consisting of alpha olefin polymer, conjugated diene polymers, and hydrogenated conjugated diene polymer wherein at least 50% of the original olefinic double bonds have been reduced by hydrogenation said block having average molecular weight between about 10,000 and 1,000,000 and n is an integer between 1 and 25.

4,400,479

PAINT ADAPTED FOR USE AS REPAIR PAINT FOR DAMAGED PAINTED SURFACES

Teunis M. Bos, Rotterdam, Netherlands, assignor to Akzo NV, Arnhem, Netherlands

Filed Jun. 30, 1981, Ser. No. 278,995

Claims priority, application Netherlands, Jul. 3, 1980, 8003847

Int. Cl.³ C09D 3/81; C08L 1/10, 1/16

U.S. Cl. 524—38 15 Claims

1. A coating composition adapted for repairing a damaged coating on a substrate comprising

1. 10–60 parts by weight of a polyacrylate having an acid number of 0–15 and a weight average molecular weight in the range of from 10,000 to 60,000,

2. 30–75 parts by weight of an acrylated alkyd resin having an acid number in the range of from 4 to 21 and a weight average molecular weight in the range of from 7,000 to 13,000, and obtained by polymerization of a mixture of 20–80 percent by weight of an acrylate monomer and 80–20 percent by weight of an ethylenically unsaturated alkyd resin having a weight average molecular weight in

the range of from 500 to 1,500 and an iodine number in the range of from 20 to 70, and

3, 5–45 parts by weight of a cellulose ester, the three basic components together forming 100 parts by weight of the binder; and

4. A volatile inert organic solvent for 1, 2, and 3.

4,400,480

PROCESS FOR PREPARING CORRUGATED PAPERBOARD

Michael A. Silano, Somerset, N.J., and Robert D. Featherston, Salisbury, N.C., assignors to National Starch and Chemical Corporation, Bridgewater, N.J.

Division of Ser. No. 268,960, Jun. 1, 1981, Pat. No. 4,366,275. This application Sep. 2, 1982, Ser. No. 414,196

Int. Cl.[3] **C09J** *3/06;* **C08J** *3/10;* **C08L** *3/04, 61/02*

U.S. Cl. 524—47 **4 Claims**

1. A process for preparing corrugated paperboard comprising the steps of:

(1) applying to the tips of the corrugations of a fluted paper strip a water-resistant alkaline curing corrugating adhesive composition comprising:

A. from about 10 to 40%, based on total weight of the adhesive, of starch, this including the ungelatinized as well as the gelatinized portions of the starch;

B. from about 0.3 to 5%, based on total weight of the starch, of an alkali;

C. from about 54 to 89%, based on total weight of the adhesive, of water; and

D. from about 0.3 to 10%, based on total weight of the starch, dry basis, of a crosslinking additive prepared by reacting acetone and formaldehyde in a molar ratio of 1 mole of acetone to about 2 to 5.5 moles of formaldehyde under aqueous alkaline conditions at about 20°–80° C. to obtain a water-soluble acetone-formaldehyde condensate containing about 1–10% unreacted formaldehyde; adding to the condensate at least an effective amount of dihydroxyethylene urea to react with the unreacted formaldehyde present therein; and allowing the reaction to proceed at about 20°–80° C. until the unreacted formaldehyde remaining is reduced to about 0.1–2% by weight; and

(2) applying a facing to the adhesive-coated tips of said fluted paper strip to form an adhesive bond.

4,400,481

FINISHER AND PRESERVER FOR LITHOGRAPHIC PLATES

Sunit S. Dixit, Naperville, and William V. Stansky, Jr., Villa Park, both of Ill., assignors to Richardson Graphics Company, Des Plaines, Ill.

Continuation of Ser. No. 204,334, Nov. 5, 1980, abandoned. This application Aug. 20, 1982, Ser. No. 409,959

Int. Cl.[3] **C08L** *5/00, 93/00;* **B41N** *3/00*

U.S. Cl. 524—55 **17 Claims**

1. A finisher and preserver for lithographic plates comprising a single-phase aqueous composition consisting essentially of:

a blend of natural gum resin and synthetic hydrophilic resins in a total amount of between about 2 and 12 weight percent, based on the total weight of the aqueous composition, said resin blend including between about 1 and about 5 weight percent of the natural gum resin, between about 0.5 and about 5 weight percent of a cyclic amide synthetic hydrophilic resin, and between about 0.1 and about 2 weight percent of a polyacrylamide synthetic hydrophilic resin, all based on the total weight of the aqueous composition, wherein said resin blend includes a ratio of about 6 parts by weight of the natural gum resin, to about 3 parts by weight of the cyclic amide synthetic hydrophilic resin, to about 1 part by weight of the polyacrylamide synthetic hydrophilic resin,

between about 0.05 and about 1 weight percent of a preservative for said natural resin, based on the total weight of the aqueous composition,

a buffering system of phosphate and phosphoric acid, said buffering system being between about 0.5 and about 5 weight percent based on the total weight of the aqueous composition,

a surfactant constituent in a total amount of between about 0.01 and about 0.2 weight percent, based on the total weight of the aqueous composition, and

between about 85 and 95 weight percent water, based on the total weight of the aqueous composition, each of said blend of resins, preservatives, buffering system and surfactant constituent being in admixture with each other and being dissolved in said water in a single phase.

4,400,482

NOVEL FLUOROELASTOMER FILM COMPOSITIONS CONTAINING SILANE COMPOUNDS AND METHOD FOR THE PREPARATION THEREOF

Donald Close, Stow, Ohio, assignor to David Hudson, Inc., Stow, Ohio

Continuation of Ser. No. 178,788, Aug. 18, 1980, Pat. No. 4,323,603. This application Mar. 18, 1982, Ser. No. 359,361

The portion of the term of this patent subsequent to Apr. 6, 1999, has been disclaimed.

Int. Cl.[3] **B05D** *3/02*

U.S. Cl. 524—114 **13 Claims**

1. A method for preparing fluoroelastomer film composition solutions including the steps of:

dissolving a fluoroelastomer gum in a solvent; and

adding a silane compound to said gum solution said silane compound having the formula $RCH_2CH_2CH_2SiR'_{3-n}(OR'')_n$, where R is an organofunctional group selected from the group consisting of amine and epoxy molecules; R′ is a simple alkyl group having about one to five carbon atoms; OR″ is a hydrolyzable alkoxy group, R″ being an alkyl group having about one to four carbon atoms and n is 1, 2 or 3; with the proviso that said fluoroelastomer gum and -silane solution be devoid of metallic oxide.

4,400,483

THERMOPLASTIC ELASTOMER COMPOSITIONS FOR LOW PRESSURE MOLDING

Roy W. Siedenstrang, and William H. Cornell, both of Stow, Ohio, assignors to Phillips Petroleum Company, Bartlesville, Okla.

Division of Ser. No. 825,175, Aug. 17, 1977, Pat. No. 4,288,399. This application Mar. 27, 1981, Ser. No. 248,372

Int. Cl.[3] **C08K** *5/17, 5/05;* **C08L** *25/10*

U.S. Cl. 524—247 **7 Claims**

1. A molding composition suitable for being molded at a pressure of 200 psig or less said composition comprising (1) a thermoplastic elastomer that is a normal solid, linear or radial teleblock copolymer comprising about 30 to about 100 weight percent of the total polymeric component of the composition, (2) solid resinous polymer that is a polymer of a vinyl-substituted aromatic compound comprising about 0 to about 70 weight percent of the total polymeric component composition, and (3) an amount of a polarizing agent sufficient to allow heating the molding composition to a moldable consistency by exposure to energy at microwave frequency, said polarizing agent selected from among mixtures of at least one compound chosen from among (1) simple and polymeric alkylene glycols, their mono and dialkyl ethers with at least one compound chosen from among (2) ethanolamines, isopropanolamines, and their hydrocarbylsubstituted derivatives.

4,400,484

ESTERS AS PROCESSING AIDS FOR OLEFINIC NITRILE COPOLYMERS

Brandford E. Giddings, Shaker Heights; Richard J. Jorkasky, II, Bedford, both of Ohio, and Kim L. Thornton, Evanston, Ill., assignors to The Standard Oil Company, Cleveland, Ohio

Filed May 15, 1980, Ser. No. 150,021
Int. Cl.[3] C08K 5/12, 5/10, 5/11
U.S. Cl. 524—296 7 Claims

1. A composition which comprises an intimate mixture of (1) a copolymer produced by the polymerization of a major proportion of a monounsaturated nitrile and a minor portion of another monovinyl monomer component copolymerizable therewith in the presence of a preformed diene rubber; and (2) a lubricant selected from the group consisting of an diacetate ester of hydroquinone or an diacetate ester of resorcinol.

4,400,485

RUBBER COMPOSITION

Harold Mukamal, Seal Beach, Calif.; Richard S. Lamar, Littletown, Colo., and Laurence E. Ferreira, Pacific Palisades, Calif., assignors to Standard Oil Company (Indiana), Chicago, Ill.

Filed Aug. 28, 1981, Ser. No. 297,175
Int. Cl.[3] C08K 3/34
U.S. Cl. 524—444 48 Claims

1. A rubber composition formed according to an improved rubber compounding process, wherein the improvement comprises vulcanizing natural rubber, polybutadiene rubber, polyisoprene rubber, or styrene-butadiene rubber containing a substantially uniform dispersion of:

A. 1. particulate Agent E at a level of from about 5 to about 200 phr,
2. Agent F at a level of from about 0.005 to about 15 phr, and
3. Agent G at a level of from about 0.005 to about 15 phr; or

B. 1. a particulate adduct of Agents E and F having a median particle size in the range of from about 0.01 to about 20 microns and present at a level such that the portion thereof contributed from Agent E is at a level of from about 5 to about 200 phr and the portion thereof contributed from Agent F is at a level of from about 0.005 to about 15 phr, and
2. Agent G at a level of from about 0.005 to about 15 phr; or

C. 1. a particulate adduct of Agents E and G having a median particle size in the range of from about 0.01 to about 20 microns and present at a level such that the portion thereof contributed from Agent E is at a level of from about 5 to about 200 phr and the portion thereof contributed from Agent G is at a level of from about 0.005 to about 15 phr, and
2. Agent F at a level of from about 0.005 to about 15 phr; or

D. a particulate adduct of Agents E, F, and G having a median particle size in the range of from about 0.01 to about 20 and present at a level such that the portion thereof contributed from Agent E is at a level of from about 5 to about 200 phr, the portion thereof contributed from Agent F is at a level of from about 0.005 to about 15 phr and the portion thereof contributed from Agent G is at a level of from about 0.005 to about 15 phr;

wherein Agent E comprises phyllosilicate mineral particles having a median particle size in the range of from about 0.01 to about 20 microns;

wherein Agent F comprises an organosilane of formula I

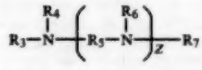
(I)

wherein X is a group which is, or which upon hydrolysis forms a group which is, capable of reacting with a reactive site on the phyllosilicate mineral particles so as to form a bond between the organosilane of formula I and the phyllosilicate mineral particles,

wherein Y is an alkyl, aryl or alkyl-substituted aryl group containing from 1 to 20 carbon atoms and bears a functional group capable of reacting with a reactive site on the rubber so as to form a bond between the organosilane of formula I and the rubber, and

wherein R_1 and R_2 are the same or different and are each selected from the group consisting of the groups described by X and Y, an alkyl group containing from 1 to 20 carbon atoms, an aryl group, and an alkyl-substituted aryl group wherein the alkyl substituents contain a total of from 1 to 20 carbon atoms; and

wherein Agent G comprises an amine of formula II



(II)

wherein Z is zero or a positive integer from 1 to 12,

wherein R_3, R_4, R_6 and R_7 are the same or different and are each selected from the group consisting of hydrogen, an alkyl group containing from 1 to 20 carbon atoms, an aryl group and an alkyl-substituted aryl group wherein the alkyl substituents contain a total of from 1 to 20 carbon atoms,

wherein R_5 is an alkylene group containing from 2 to 16 carbon atoms,

wherein, when Z is zero, at least one of R_3, R_4 and R_7 bears a first functional group which is selected from the group consisting of a mercapto group, allyl group, vinyl group, epoxy group, methacryloxy group, acryloxy group, hydroxy group, and a group hydrolyzable to a hydroxy group, and at least one of R_3, R_4 and R_7 bears a second functional group which is, or which upon hydrolysis forms a group which is selected from the group consisting of a hydroxy group, an alkoxy group, a mercapto group, and a sulfide group and which second functional group is located at a carbon atom which is beta or gamma to the nearest tertiary nitrogen atom in formula II, and

wherein, when Z is not zero, at least one of R_3, R_4, R_6 and R_7 bears a first functional group which is selected from the group consisting of a mercapto group, allyl group, vinyl group, epoxy group, methacryloxy group, acryloxy group, hydroxy group, a group hydrolyzable to a hydroxy group, and, in addition, when R_5 contains more than 3 carbon atoms, at least one of R_3, R_4, R_6 and R_7 bears a second functional group which is, or which upon hydrolysis forms a group which is, selected from the group consisting of a hydroxy group, an alkoxy group, a mercapto group, and a sulfide group and which second functional group is attached to a carbon atom which is beta or gamma to the nearest tertiary nitrogen atom in formula II.

4,400,486

ACRYLIC ADHESIVE COMPOSITION CONTAINING CYCLOPENTADIENE RESIN

Riso Iwata, Tokyo, and Akira Wada, Yokohama, both of Japan, assignors to Nippon Zeon Co. Ltd., Tokyo, Japan

Filed Aug. 18, 1982, Ser. No. 409,315
Claims priority, application Japan, Aug. 26, 1981, 56-133745
Int. Cl.³ C08L *33/08, 45/00*
U.S. Cl. 525—57 **8 Claims**

1. An acrylic adhesive composition comprising an acrylate ester polymer as a base resin and a modified cyclopentadiene resin having a softening point of at least 60° C. obtained by copolymerizing (a) 85 to 50% by weight of a cyclopentadiene monomer and (b) 15 to 50% by weight of a polar vinyl monomer or a hydrogenation product of said cyclopentadiene resin as a tackifier.

4,400,487

TEXTURED FLUOROCARBON COATING COMPOSITIONS

Richard L. Stoneberg, and Raymond R. Stec, both of Pittsburgh, Pa., assignors to PPG Industries, Inc., Pittsburgh, Pa.

Filed Dec. 31, 1981, Ser. No. 336,155
Int. Cl.³ C08L *27/12, 27/16*
U.S. Cl. 525—199 **10 Claims**

1. A coating composition useful for providing a substrate with a coating having a textured appearance, comprising, on a resin solids basis, a resinous mixture of:

(a) from about 40 percent to about 85 percent by weight of a film-forming fluorocarbon resin having a particle size of from about 0.1 microns to about 5 microns;

(b) from 0 percent to about 50 percent by weight of a thermoplastic acrylic resin selected from homoplymers and copolymers of acrylic acid esters or methacrylic acid esters and thermosetting copolymers of acrylic monomers containing hydroxyl or amide groups; and

(c) from about 3 percent to about 50 percent by weight of a particulate fluorocarbon resin having a particle size ranging from about 20 microns to about 3500 microns, said particulate fluorocarbon resin being fused with the film-forming fluorocarbon resin upon curing to provide said textured appearance.

4,400,488

COMPOSITION AND METHOD OF IMPROVING THE UNVULCANIZED PROPERTIES OF BLENDS CONTAINING RECLAIMED RUBBER

Joginder Lal, Akron, and Sandra J. Walters, Stow, both of Ohio, assignors to The Goodyear Tire & Rubber Company, Akron, Ohio

Division of Ser. No. 161,830, Jun. 23, 1980, Pat. No. 4,341,667, which is a continuation-in-part of Ser. No. 42,275, May 24, 1979, Pat. No. 4,243,561, which is a division of Ser. No. 779,382, Mar. 21, 1977, Pat. No. 4,198,324. This application Apr. 28, 1982, Ser. No. 372,856
Int. Cl.³ C08L *17/00;* **B29H** *19/00*
U.S. Cl. 525—211 **23 Claims**

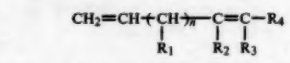
1. A prevulcanization process for producing a reclaimed rubber blend, comprising:

improving the green strength of a reclaimed rubber-elastomer blend by

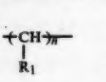
obtaining from about 5 parts by weight to about 100 parts by weight of reclaimed rubber, said reclaimed rubber produced by devulcanizing scrap rubber with microwave energy, said reclaimed rubber selected from the group consisting of polychloroprene, chlorobutyl rubber, bromobutyl rubber, butyl rubber, nitrile rubber, nitrile rubber-poly(vinyl chloride) blends having up to 30 percent by weight by poly(vinyl chloride), EPDM, natural or synthetic cis-1,4-polyisoprene, polyalkenylenes, elastomers made from monomers selected from the group consisting of conjugated dienes having from 4 to 10 carbon atoms, interpolymers of said dienes (1) among themselves, or (2) with monomers selected from the group consisting of vinyl substituted hydrocarbon compounds having from 8 to 12 carbon atoms, and combinations thereof;

adding to said reclaimed rubber from about 95 parts by weight to about 0 parts by weight of an elastomer, said elastomer selected from the group consisting of natural or synthetic cis-1,4-polyisoprene, polyalkenylenes, elastomers made from monomers selected from the group consisting of conjugated dienes having from 4 to 10 carbon atoms, interpolymers of said dienes (1) among themselves, or (2) with monomers selected from the group consisting of vinyl substituted hydrocarbon compounds having from 8 to 12 carbon atoms; and combinations thereof, the total amount of said reclaimed rubber and said elastomer being 100 parts by weight;

adding to said reclaimed rubber and said elastomer a semi-crystalline butene polymer having a number average molecular weight of from about 30,000 to about 500,000, the amount of said butene polymer ranging from about 2 parts by weight to about 30 parts by weight per 100 parts by weight of said elastomer-reclaimed rubber mixture, said butene polymer selected from the group consisting of polybutene and interpolymers made from 1-butene monomer and at least one monomer selected from the group consisting of (a) alpha-olefins having 2 through 16 carbon atoms, (b) non-conjugated dienes having the formula:



where R_1, R_2 and R_3 is a hydrogen, a lower alkyl group containing from 1 to 4 carbon atoms, or an aryl group; where R_4 is an aryl group or a lower alkyl group containing from 1 to 9 carbon atoms, and n is an integer having a value of from 1 to 6, and wherein the said R_1's in the



group may be similar or dissimilar, (c) non-conjugated alpha-, omega-polyenes having from 6 to 36 carbon atoms which may or may not contain internal unsaturation, and (d) combinations thereof, said butene in said interpolymers comprises from 99.9 to 65 mole percent of the total monomers; and

mixing said elastomer, said reclaimed rubber and said butene polymer to produce an elastomer-reclaimed rubber blend having improved green strength before vulcanization.

4,400,489

AERIALLY-CROSSLINKING POLYACRYLATE COATING AGENTS

Rolf Dhein, and Lothar Fleiter, both of Krefeld, Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Filed Nov. 23, 1981, Ser. No. 323,763
Claims priority, application Fed. Rep. of Germany, Nov. 27, 1980, 3044695
Int. Cl.³ C09D *3/727, 3/80*
U.S. Cl. 525—301.5 **7 Claims**

1. An aerially-cross-linking coating agent comprising an aerially-cross-linking binder comprising a dicarboxylic acid semi-ester formed by the reaction of a copolymer consisting of copolymerised units of at least one ester carrying at least one 1,2-epoxide group or hydroxyl group of an α,β-monoolefinically unsaturated C_3–C_5-carboxylic acid and at least one vinyl or vinylidene monomer which is different therefrom with at least one drying fatty acid wherein the coating agent contains as an additional lacquer auxiliary from 0.2 to 2% by weight of

at least one β-dicarbonyl compound, based on the aerially-cross-linking binder.

4,400,490

NYLON COMPOSITIONS AND RIM PROCESS FOR MAKING SAME

Wei-Yeih W. Yang, Maple Heights, Ohio, assignor to The B.F. Goodrich Company, Akron, Ohio

Filed Jan. 18, 1982, Ser. No. 340,179
Int. Cl.³ C08G 69/16, 69/24
U.S. Cl. 525—423 18 Claims

1. A process comprising the steps of mixing liquid mixture A and liquid mixture B to form liquid mixture C, introducing liquid mixture C into a mold maintained at an elevated temperature wherein a chemical reaction takes place to convert the liquid to a solidified mass, said mixture A comprising a lactam, an epoxy component having at least one free epoxy group per molecule, and a promoter that can be used in lactam polymerization; said mixture B comprising a lactam and a catalyst that can be used in lactam polymerization; amounts of the catalyst and promoter being sufficient to catalyze and to initiate the anionic polymerization, amount of said lactam being at least 75% and up to about 98% and amount of said epoxy component being up to about 25% but more than about 2%, based on the total weight of lactam and epoxy component used.

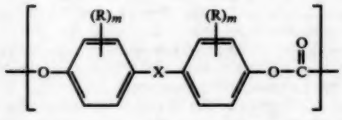
4,400,491

COPOLYESTER CARBONATES AND THE ADMIXTURE THEREOF WITH KNOWN POLYCARBONATES TO GIVE THERMOPLASTIC MOULDING COMPOSITIONS

Peter Käfer, Krefeld; Leo Morbitzer, Cologne; Werner Nouvertne, and Dieter Neuray, both of Krefeld, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

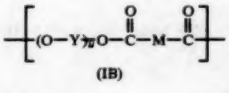
Filed May 17, 1982, Ser. No. 379,375
Claims priority, application Fed. Rep. of Germany, May 23, 1981, 3120594
Int. Cl.³ C08G 63/64
U.S. Cl. 525—439 9 Claims

1. A thermoplastic copolyester carbonate of formula (I) composed of structural units of the general formulae (IA) and (IB);



(I)

(IA)



(IB)

wherein

R denotes a hydrogen, chlorine or bromine atom or a C_1 to C_3 alkyl group,

m is 0, 1 or 2,

X denotes a direct bond or a C_1 to C_8 alkylene, C_2 to C_8 alkylidene, cyclohexylene, cyclohexylidene, $-SO_2$ or —S radical,

Y denotes $-(CH_2)_4$,

M denotes a radical of hexahydrophthalic acid or a radical of trimethyladipic acid, and

u is an integer of from 10 to 50,

said copolyester carbonate having an average weight-average molecular weight $\overline{M}w$ of from 15,000 to 200,000, and which contains 50 to 95% by weight of aromatic polycarbonate segments and 50 to 5% by weight of polyester segments having an average number-average molecular weight $\overline{M}n$ of from 2,000 to 20,000.

4,400,492

COLOR-DEVELOPER FOR PRESSURE-SENSITIVE RECORDING SHEETS

Makoto Asano, Yokohama; Saburo Kawashima, Yokosuka; Yoshimitu Tanabe, and Hisamichi Murakami, both of Yokohama, all of Japan, assignors to Mitsui Toatsu Chemicals, Inc., Tokyo, Japan

Filed Mar. 24, 1981, Ser. No. 247,123
Claims priority, application Japan, Apr. 4, 1980, 55-43547; Apr. 8, 1980, 55-45198
Int. Cl.³ C08G 8/12, 8/20, 8/24, 8/28
U.S. Cl. 525—506 14 Claims

1. A color developer for pressure-sensitive recording sheets, said color-developer comprising a co-condensate obtained by co-condensing a reaction intermediate of at least one p-substituted phenol with at least one higher functional phenol selected from the group consisting of 4,4'-isopropylidene-biphenol, 4,4'cyclohexylidene-biphenol and 4,4'-biphenol sulfon under neutral or acidic conditions, and/or a polyvalent metal salt of the said co-condensate, said reaction intermediate being obtained by reacting said p-substituted phenol under acidic conditions with at least an equimolar amount of formaldehyde or a substance capable of generating formaldehyde.

4,400,493

POLYMERIZATION OF ISOBUTYLENE

Marshall W. Abernathy, Jr., and Kenneth C. Jurgens, Jr., both of Big Spring, Tex., assignors to Cosden Technology, Inc., Dallas, Tex.

Filed Apr. 7, 1982, Ser. No. 366,116
Int. Cl.³ C08F 4/14
U.S. Cl. 526—68 5 Claims

1. In a process for the continuous, liquid phase, catalytic polymerization of isobutylene contained in a hydrocarbon feed mixture, wherein the hydrocarbon feed mixture is continuously introduced into a reaction zone containing aluminum trichloride catalyst and maintained at a constant controlled reaction temperature and pressure, and a portion of the liquid reaction mixture continuously removed to recover the polyisobutylene contained therein, the improvement in maintaining the desired reaction temperature which comprises vaporizing unreacted hydrocarbons in the reaction zone in a quantity sufficient to remove the heat generated in the exothermic reaction, continuously removing, compressing and condensing said vaporized hydrocarbons to yield a liquid condensate under a pressure and at a temperature higher than that maintained in the reaction zone, reducing the pressure on said condensate to the extent necessary to vaporize some of the hydrocarbons in the condensate thereby reducing the temperature of the liquid condensate to that of the reaction zone, separating the vaporized hydrocarbons and recycling the liquid condensate to the reaction zone.

4,400,494

OLEFIN POLYMERIZATION CATALYST

Gregory G. Arzoumanidis, and Benjamin S. Tovrog, both of Naperville, Ill., assignors to Standard Oil Company (Indiana), Chicago, Ill.

Filed Aug. 28, 1981, Ser. No. 297,272
Int. Cl.³ C08F 2/34, 10/06
U.S. Cl. 526—119 20 Claims

1. A process for polymerization of propylene or a mixture of propylene and a minor amount of copolymerizable alpha-olefin comprising contacting in the vapor phase propylene or a mixture of propylene and a copolymerizable alpha-olefin with a catalyst comprising:

A. a solid titanium-containing component formed by steps comprising (1) reducing titanium tetrachloride with an

aluminum alkyl and (2) reacting the resulting solid with a Lewis base complexing agent and a Lewis acid; and

B. an ethyl aluminum halide having a halogen/aluminum atomic ratio between 0.89 and 0.98.

4,400,495

WOOD MODIFYING COMPOSITION

Gennady M. Shutov; Maiya E. Erdman; Adel I. Solomakha, and Evgeny A. Kalennikov, all of Minsk, U.S.S.R., assignors to Belorussky Politekhnichesky Institute, Minsk, U.S.S.R.

Filed Aug. 26, 1981, Ser. No. 296,279

Int. Cl.³ C08K *5/56*

U.S. Cl. 524—176 **4 Claims**

1. A wood modifying composition comprising the following components take in percent by mass:

phenol-furfural-formaldehyde resin	72.0 to 94.0
benzensulfonic acid catalyst	0.8 to 1.5
stabilizing agent selected from the group consisting of ferrocene, monoacetylferrocene and mixtures thereof	0.5 to 1.5
acetone	the balance to 100

4,400,496

WATER-SOLUBLE GRAFT COPOLYMERS OF STARCH-ACRYLAMIDE AND USES THEREFOR

George B. Butler; Thieo E. Hogen-Esch, both of Gainesville, Fla.; John J. Meister, Dallas, Tex., and Huey Pledger, Jr., Gainesville, Fla., assignors to University of Florida, Tallahassee, Fla.

Filed Sep. 22, 1980, Ser. No. 188,999

Int. Cl.³ C08F *251/00*; C08L *3/12*

U.S. Cl. 527—312 **5 Claims**

1. Water-soluble graft copolymer comprising a backbone molecule of water-soluble starch with branch chains grafted thereto of polymerized acrylamide units or a mixture of polymerized acrylamide units and polymerized acrylic acid units.

4,400,497

STORAGE STABLE, HEAT CURABLE MIXTURES OF POLYISOCYANATE AND POLYOL AND PROCESS FOR THEIR MANUFACTURE AND USE

Rainer Blum, Ludwigshafen; August Lehner, Roedersheim-Gronau, both of Fed. Rep. of Germany, and Hans-Uwe Schenck, Grosse Ile, Mich., assignors to BASF Aktiengesellschaft, Ludwigshafen, Fed. Rep. of Germany

Filed Mar. 11, 1982, Ser. No. 356,955

Claims priority, application Fed. Rep. of Germany, Mar. 27, 1981, 3112054

Int. Cl.³ C08G *18/80*

U.S. Cl. 528—45 **9 Claims**

1. A mixture comprising

(a) a polyisocyanate in the form of discrete particles having diameters of 0.1 micron to 150 microns which are deactivated at their surface such that from 0.5 to 20 equivalent percent of the total isocyanate groups present are deactivated; and

(b) a polyol.

4,400,498

THERMOPLASTIC POLYURETHANE RESINS

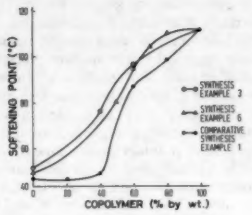
Shin Konishi; Mitsuhiro Yoshida; Masatake Katagiri, all of Yokohama; Masashi Somezawa, Sendai; Yoshinobu Ninomiya, Miyagi, and Akira Hashimoto, Tagajyo, all of Japan, assignors to Sony Corporation and Nippon Polyurethane Industry Co., Ltd., both of Tokyo, Japan

Filed Dec. 24, 1981, Ser. No. 334,254

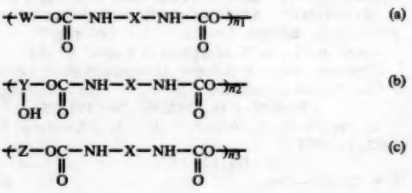
Claims priority, application Japan, Dec. 29, 1980, 55-188182

Int. Cl.³ C08G *69/00, 69/08, 69/14*

U.S. Cl. 528—60 **22 Claims**



1. A thermoplastic polyurethane resin having a molecular weight larger than 5,000 and comprising a combination of units represented by the following formulas:



(wherein

W is a residue derived by the elimination of the two hydroxyl groups from a long chain diol (A) having a molecular weight in a range of about 500 to 3,000;

X is a residue derived by the elimination of the two isocyanate groups from an organic isocyanate (C);

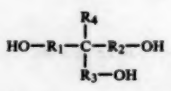
Y is a residue derived by the elimination of the two hydroxyl groups from a short chain triol (D) having a molecular weight in a range lower than about 500;

Z is a residue derived by the elimination of the two hydroxyl groups from a short chain diol (B) having a molecular weight in a range of about 50 to 500;

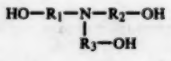
n_1 and n_2 are each a positive integer; and

n_3 is 0 or a positive integer;

said short chain triol (D) being represented by the formula (II):

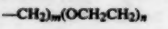


or by the formula (III):



(wherein

R_1 is a group represented by the formula:



(where m and n are each an integer from 0 to 6, provided that, when one of m and n is 0, the other is an integer other than 0);

R_2 is a group represented by the formula:

$$-CH_2)_p(OCH_2CH_2)_q$$

(where p and q are each an integer from 0 to 6, provided that, when one of p and q is 0, the other is an integer other than 0);

R_3 is a group represented by formula:

$$\left(CH_2\right)_r CH-$$
$$\quad\quad |$$
$$\quad\quad CH_3$$

(where r is an integer from 0 to 3) or a group represented by formula:

$$\left(OCH_2-CH\right)_r$$
$$\quad\quad\quad\quad |$$
$$\quad\quad\quad\quad CH_3$$

(where r has the same meaning as above); and

R_4 is a group represented by formula:

$$-C_sH_{2s+1}$$

(where s is an integer from 0 to 4);

obtainable by the polyaddition reaction of the long chain diol (A), the organic diisocyanate (C) and the short chain triol (D) and, as desired, the short chain diol (B) in the ratios of:

$$b/a \leqq 3 \quad \text{(i)}$$

$$1 < c/(a+b) < 3 \quad \text{(ii)}$$

$$\frac{1}{4} \leqq \frac{c-(a+b)}{d} < 1 \quad \text{(iii)}$$

(wherein

a is a molar number of the long chain diol (A);

b is a molar number of the short chain diol (B);

c is a molar number of the organic diisocyanate (C); and

d is a molar number of the short chain triol (D)).

4,400,499

INTEGRATED PROCESS FOR THE PREPARATION OF SUBSTANTIALLY LINEAR HIGH MOLECULAR WEIGHT THERMOPLASTIC POLYMERS FROM ARYL POLYHALIDE MONOMERS

Ismael Colon, Middlesex, N.J., assignor to Union Carbide Corporation, Danbury, Conn.

Filed Dec. 29, 1981, Ser. No. 335,521

Int. Cl.³ C08G 65/40, 75/23

U.S. Cl. 528—174 **34 Claims**

1. An integrated process for preparing a substantially linear thermoplastic polymer derived from an aryl polyhalide monomer which comprises:

(i) contacting a phenol compound with about stoichiometric amounts of an alkali metal carbonate or hydroxide sufficient to form an alkali metal salt of the phenol compound in a liquid phase of an aprotic solvent and an azeotrope former and for a time and at a temperature sufficient to form the alkali metal salt of the phenol compound;

(ii) contacting the alkali metal salt of the phenol compound with a dihalobenzenoid compound sufficient to form an aryl polyhalide monomer in a liquid phase of an aprotic solvent and an azeotrope former for a time and at a temperature sufficient to form the aryl polyhalide monomer, wherein the dihalobenzenoid compound has an inert electron withdrawing group in one or more of the positions ortho and para to the halogen atoms thereby activating the halogen atoms to a level sufficient to react with said alkali metal salt of the phenol compound;

(iii) removing water from the reaction mass of (i) and (ii) as an azeotrope with said azeotrope former until substantially anhydrous conditions are attained and excess azeotrope former is substantially removed; and

(iv) coupling aryl polyhalide monomers by contacting said monomers with a catalyst mixture in the presence of a reducing metal selected from the group consisting of zinc, magnesium and manganese or mixtures thereof and in a liquid phase of an aprotic solvent under substantially anhydrous conditions for a time and at a temperature sufficient to form a substantially linear thermoplastic polymer, wherein the catalyst mixture comprises an anhydrous nickel compound and at least one ligand selected from the group consisting of a triarylphosphine having from about 6 to about 14 carbon atoms in each aryl moiety and an aromatic bidentate compound containing at least one ring nitrogen atom and from about 5 to about 30 carbon atoms and wherein the ratio of gram atoms of nickel per mole of aryl polyhalide monomer is from about 0.001 to about 0.1, the amount of ligand is from about 1 to about 50 moles per gram atom of nickel and the amount of reducing metal is at least about 1 mole of reducing metal per mole of aryl polyhalide monomer.

4,400,500

POLYAMINOESTER THERMOSETTING RESINS

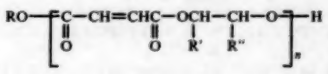
Everett J. Kelley, Moorestown, N.J., and Casmir S. Ilenda, Hulmeville, Pa., assignors to Rohm and Haas Company, Philadelphia, Pa.

Filed Apr. 30, 1982, Ser. No. 373,371

Int. Cl.³ C08G 69/26

U.S. Cl. 528—345 **7 Claims**

1. A thermosetting polymer composition comprising the reaction product of one or more oligomers of the formula:



(I)

wherein

n represents two to ten maleate units,

R represents alkyl, hydroxyalkyl, or acyloxyalkyl,

and

R′ and R″ are —H, $-CH_3$, $-C_2H_5$, $-CH_2Cl$, $-CH_2Br$, $-C_6H_5$(phenyl), $-CH_2OCOCH{=}CH_2$, $-CH_2OCOC(CH_3){=}CH_2$, 13 $CH_2OCH_2CH{=}CH_2$, $-CH_2OC_4H_9$, or

R′ together with R″ is $-C_4H_8-$(cyclic), with one or more polyamines.

4,400,501

ANHYDROUS PRECIPITATION OF POLYCYCLOOLEFINS

Parley C. Lane, Jr., Cuyahoga Falls; Linwood P. Tenney, Hudson, and Gerald V. Wootton, Akron, all of Ohio, assignors to The B. F. Goodrich Company, Akron, Ohio

Filed May 10, 1982, Ser. No. 376,368

Int. Cl.³ C08F 6/12

U.S. Cl. 528—496 **10 Claims**

1. Process for preciptating a polymer from a cement comprising said polymer dissolved in cyclohexane, said process comprising mixing said cement with a sufficient amount of methanol to precipitate said polymer thus forming a polymer slurry containing polymer solids dispersed in cyclohexane and methanol; vaporizing methanol and cyclohexane in azeotropic proportion from said polymer slurry leaving behind spent

polymer slurry containing essentially said polymer and methanol; condensing the vaporized methanol and cyclohexane whereby the condensate separates into an upper and a lower phase, the upper phase being essentially all cyclohexane whereas the bottom phase being rich in methanol; and separating said polymer from methanol; said polymer being a reaction product formed by ring opening polymerization of at least one norbornene-type monomer.

4,400,502

READILY DISPERSIBLE ANIONIC, WATER-SOLUBLE CELLULOSE DERIVATIVES AND A METHOD FOR THEIR PREPARATION

Thomas G. Majewicz, Chadds Ford, Pa., assignor to Hercules Incorporated, Wilmington, Del.

Filed Apr. 27, 1982, Ser. No. 372,357
Int. Cl.³ C08B *11/193, 11/20*
U.S. Cl. 536—87 **11 Claims**

1. A method for making a dispersible, anionic, water-soluble cellulose ether comprising:

(a) contacting a particulate anionic water-soluble cellulose ether with an aqueous medium prepared from water, glyoxal, and a sodium borate to form a product;

(b) recovering the resulting product; and

(c) drying the recovered product.

10. A particulate anionic water-soluble cellulose ether which has been treated with an aqueous medium prepared from water and the reaction product of glyoxal and a sodium borate.

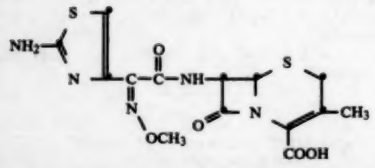
4,400,503

PURIFICATION OF SYN-7-[[(2-AMINO-4-THIAZOLYL)(METHOXYIMINO) ACETYL]AMINO]-3-METHYL-3-CEPHEM-4-CARBOXYLIC ACID

Kuo S. Yang, Greenwood, Ind., assignor to Eli Lilly and Company, Indianapolis, Ind.

Filed Oct. 30, 1981, Ser. No. 316,615
Int. Cl.³ C07D *501/12*
U.S. Cl. 544—28 **4 Claims**

1. The process for purifying the compound of formula 2:



2

wherein the oxime is in the syn configuration which comprises preparing the crystalline hydrochloride salt of the formula 2 compound by (a) adding this compound to a solvent selected from water or a polar organic solvent to form a solution or slurry; (b) adding hydrochloric acid to give a solution which has a pH of between about 1.5 and 3.5; (c) maintaining the solution until crystallization occurs; (d) separating the crystalline salt; (e) dissolving the crystalline salt in an aqueous bicarbonate solution with the pH maintained between about 6 and about 7; (f) filtering the solution to separate solid impurities; and (g) adding hydrochloric acid to the filtered solution until free base of formula 2 precipitates.

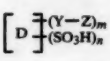
4,400,504

DIOXAZINE REACTIVE DYESTUFFS

Wolfgang Harms, and Klaus Wunderlich, both of Leverkusen, Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

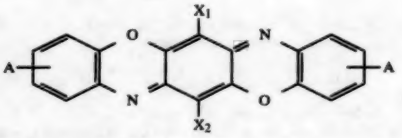
Filed Nov. 10, 1981, Ser. No. 320,044
Claims priority, application Fed. Rep. of Germany, Dec. 2, 1980, 3045471
Int. Cl.³ C07D *498/04, 521/00*
U.S. Cl. 544—76 **6 Claims**

1. A compound of the formula



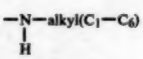
wherein

D denotes a (m+n)-valent radical derived from a dioxazine system of the formula



wherein

A stands for NH_2;

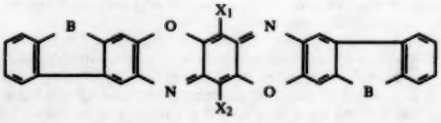


unsubstituted or substituted by SO_3H, OSO_3H, OH, O-alkyl(C_1–C_4); NH-cyclohexyl; NH-aryl unsubstituted or substituted by halogen, alkyl(C_1–C_4), O-alkyl(C_1–C_4), NH-acetyl, SO_3H; O-alkyl(C_1–C_4); O-aryl unsubstituted or substituted by alkyl(C_1–C_4) or halogen

and wherein

X_1 and X_2 independently of one another denote hydrogen, optionally substituted C_1–C_4-alkyl, cycloalkyl, optionally substituted aryl, CN, halogen, $COOR_1$ (wherein R_1 denotes H, alkyl or cycloalkyl) or $CONR_2R_3$ (wherein R_2 and R_3 independently of one another are H, optionally substituted C_1–C_4-alkyl, cycloalkyl or optionally substituted aryl), said optional substituents being OH, SO_3H, COOH or halogen, or wherein

D denotes a (m+n)-valent radical derived from a dioxazine system of the formula

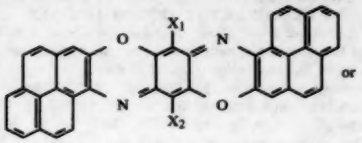


wherein

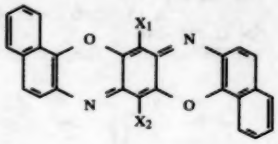
B stands for NH, NH-alkyl (C_1–C_2), O or CH_2 and wherein X_1 and X_2 have the meanings given above or

wherein

D denotes a (m+n)-valent radical derived from a dioxazine system of the formulae

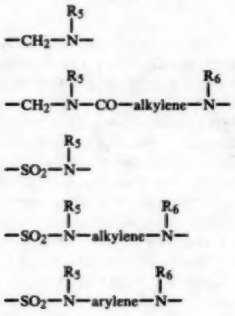


or



wherein X_1 and X_2 have the meanings given above and wherein

Y denotes a bridge member of the formulae



wherein

R_5 denotes H or C_1–C_4-alkyl which may be substituted by OH, SO_3H or OSO_3H,

R_6 denotes H or C_1–C_4-alkyl which may be substituted by OH, SO_3H or OSO_3H,

alkylene denotes alkylene radicals or cycloalkylene radicals having 1 to 6 carbon atoms, which may be interrupted by O or S and which may be substituted by OH, SO_3H or OSO_3H, and arylene denotes 1,2-, 1,3- or 1,4-phenylene radicals which may be substitutd by C_1–C_4-alkyl, halogen, SO_3H, COOH or C_1–C_4-alkoxy

wherein

m denotes 1 or 2 and

n denotes 0 to 4

and wherein

Z denotes a radical selected from 2,4-dichloro-s-triazinyl, 2,4-dibromo-s-triazinyl, 2-fluoro-4-amino-s-triazinyl, 2-chloro-4-amino-s-triazinyl, 2-bromo-4-amino-s-triazinyl, 2-carboxy-pyridinuim-4-amino-s-triazinyl, 2-fluoro-4-(C_1–C_4)alkylamino-s-triazinyl, 2-chloro-4-(C_1–C_4)alkylamino-s-triazinyl, 2-2-bromo-4-(C_1–C_4)alkylamino-s-triazinyl, 2-fluoro-4-di-(C_1–C_4)alkylamino-s-triazinyl, 2-chloro-4-di-(C_1–C_4)alkylamino-s-triazinyl, 2-bromo-4-di-(C_1–C_4)alkylamino-s-triazinyl, unsubstituted 2-fluoro-, 2-chloro-, 2-bromo-4-arylamino-5-triazinyl, 2-fluoro-, 2-chloro-, 2-bromo-4-arylamino-s-triazinyl substituted by SO_3H, COOH, SO_2—CH_2—CH_2—OSO_3H, 2-fluoro-, 2-chloro-, 2-bromo-4-(C_1–C_4)alkoxy-s-triazinyl, 2-fluoro, 2-chloro-2-bromo-4-aryloxy-s-triazinyl, 2,4,5-trifluoropyrimidyl, 2,4,5-trichloro-pyrimidyl, 2,4-difluoro-5-chloropyrimidyl, 2-fluoro-4-methyl-5-chloropyrimidyl, 2-methyl-sulphonyl-4-methyl-5-chloropyrimidyl, 2-fluoro-4,5-dichloropyrimidyl, 2,3-dichloroquinoxalin-6-carbonyl, 2,3-dichloroquinoxalin-6-sulphonyl, 2,3-dibromopropionyl, 2-bromo-acryloyl, 1,4-dichlorophthalazin-6-carbonyl, 1,4-dibromophthalazin-6-carbonyl, and 4,5-dichloro-6-pyridazon-1-phenylcarbonyl.

4,400,505

TRIAZINYL-PIPERIDINES AS LIGHT STABILIZERS FOR POLYMERS

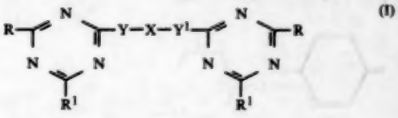
Frank F. Loffelman, Bridgewater, and Thomas E. Brady, Whitehouse Station, both of N.J., assignors to American Cyanamid Company, Stamford, Conn.

Filed Jul. 20, 1981, Ser. No. 285,240

Int. Cl.³ C07D *251/52, 251/70, 413/04*

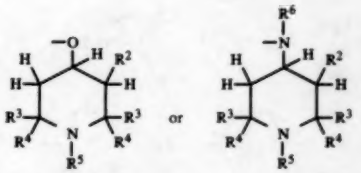
U.S. Cl. 544—198 **9 Claims**

1. A compound of the formula (I)

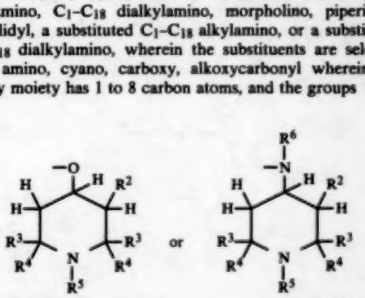


(I)

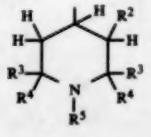
wherein R represents C_3–C_6 alkenyloxy, C_3–C_6 alkenylamino, or di(C_3–C_6 alkenyl)amino; R^1 represents C_1–C_8 alkyl, C_1–C_8 alkoxy, halo, C_1–C_8 alkylthio, C_3–C_6 alkenyloxy, amino, C_3–C_6 alkenylamino, di(C_3–C_6 alkenyl)amino,



wherein R^2, R^3, R^4, R^5, and R^6 are as defined below, C_1–C_{18} alkylamino, C_1–C_{18} dialkylamino, morpholino, piperidino, pyrrolidyl, a substituted C_1–C_{18} alkylamino, or a substituted C_1–C_{18} dialkylamino, wherein the substituents are selected from amino, cyano, carboxy, alkoxycarbonyl wherein the alkoxy moiety has 1 to 8 carbon atoms, and the groups



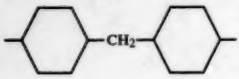
wherein R^2 represents hydrogen, C_1–C_8 alkyl, or benzyl; R^3 and R^4 independently represent C_1–C_8 alkyl, benzyl, or phenethyl, or together with the carbon to which they are attached from a C_5–C_{10} cycloalkyl; and R^5 represents hydrogen, C_2–C_3 hydroxyalkyl, C_1–C_8 alkyl, hydroxyl, or oxyl; R^6 represents hydrogen, C_1–C_8 alkyl, or

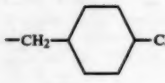


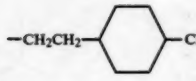
wherein R^2, R^3, R^4, and R^5 are as previously defined; Y and Y^1, which may be the same, or different, represent oxy, or

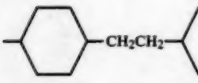
wherein R^6 is as previously defined; X represents C_2–C_{12} alkylene, wherein the alkylene chain may be interrupted by an oxy, thio, or

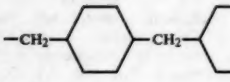
radical, C_5–C_{10} cycloalkylene,

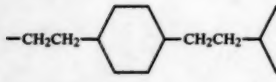


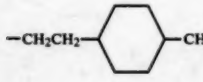




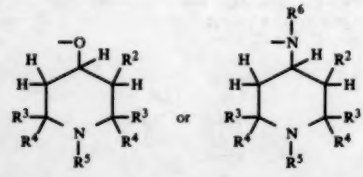








C_6–C_{12} arylene, or C_8–C_{14} aralkylene; with the proviso that when Y and Y' are oxy, or R^6 is hydrogen, or C_1–C_8 alkyl, at least one R^1 is, or contains



and with the further proviso that R and R^1 are not allyloxy at the same time.

4,400,506

PROCESSES FOR THE MANUFACTURE OF PYRIMIDO[6,1-a]ISOQUINOLINONES

Bansi Lal; Adolf D'Sa; Horst Dornauer, and Noel J. de Souza, all of Bombay, India, assignors to Hoechst Aktiengesellschaft, Frankfurt am Main, Fed. Rep. of Germany

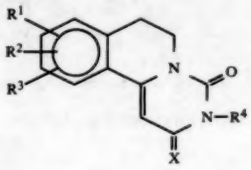
Continuation of Ser. No. 201,796, Oct. 29, 1980, abandoned, which is a continuation of Ser. No. 90,129, Nov. 1, 1979, abandoned. This application Oct. 26, 1981, Ser. No. 314,994

Claims priority, application Fed. Rep. of Germany, Nov. 3, 1978, 2847693

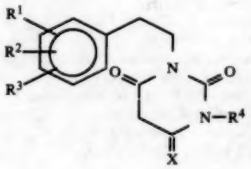
Int. Cl.³ C07D *471/04*; A61K *31/505*

U.S. Cl. 544—246 **5 Claims**

1. The method of making a compound of the formula



wherein R^1, R^2, and R^3, taken alone, are the same or different and are hydrogen, hydroxy, C_1–C_6-alkoxy, or halogen, or any two of R^1, R^2, and R^3, when in adjacent positions and taken together, are methylenedioxy or ethylenedioxy; X is oxygen or sulfur; and R^4 is hydrogen, C_1–C_6-alkoxy, C_3–C_6-cycloalkyl, C_1–C_6-alkyl substituted by C_1–C_3-alkoxy, by di(C_1–C_4-alkyl-)amino, or by di(C_1–C_4-alkyl)phosphin(C_1–C_4)alkyl, aralkyl having up to 8 carbon atoms or such aralkyl wherein the aryl group is mono- or poly-substituted by at least one member selected from the group consisting of halogen, nitro, C_1–C_3-alkoxy, and C_1–C_3-alkyl, heterocyclic alkyl or aryl or such heterocyclic alkyl or aryl mono- or poly-substituted by halogen, C_1–C_3-alkyl, C_1–C_3-alkoxy, halo-C_1–C_3-alkyl, amino, hydroxy, or by the group —OMet wherein Met is an alkali metal atom, which method comprises cyclizing a barbituric acid compound of the formula



wherein X is oxygen or sulfur, in the presence of an acid.

4,400,507

ISOINDOLINE PIGMENTS

Jost von der Crone, Riehen, Switzerland, assignor to Ciba-Geigy Corporation, Ardsley, N.Y.

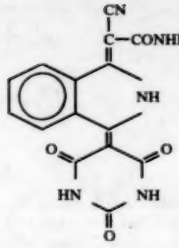
Division of Ser. No. 892,535, Apr. 3, 1978, Pat. No. 4,262,120. This application Dec. 10, 1980, Ser. No. 214,944

Claims priority, application Switzerland, Apr. 7, 1977, 4431/77

Int. Cl.³ C09B *57/04*

U.S. Cl. 544—300 **5 Claims**

1. An isoindoline pigment of the formula



wherein R is phenyl mono- or di-substituted by chlorine, bromine, methyl, methoxy, nitro, methoxycarbonyl, ethoxycarbonyl, methoxyphenylcarbamoyl, acetylaminophenylcarbamoyl or phthalimido; with the proviso that phenyl is mono-substituted when only chlorine or bromine is substituted thereon.

4,400,508

OROTIC ACID DERIVATIVES

Kiyoshi Fukui; Noboru Kakeya; Hiroshi Jibiki, and Fumio Matsuo, all of Ichihara, Japan, assignors to UBE Industries, Ltd., Ube, Japan

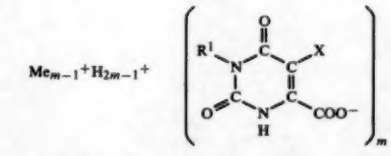
Filed Nov. 9, 1981, Ser. No. 319,793

Claims priority, application Japan, Nov. 18, 1980, 55-161384; Nov. 18, 1980, 55-161385

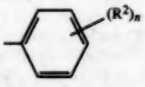
Int. Cl.³ C07D *239/24, 239/30*

U.S. Cl. 544—313 **26 Claims**

1. An orotic acid derivative represented by the general formula



where Me is an alkali metal, R^1 is an alkyl group of from 1 to 4 carbon atoms, an allyl group, a cyclohexyl group, a benzyl group, or a group



(where R^2 is an alkyl group of from 1 to 4 carbon atoms, an alkoxyl group of from 1 to 4 carbon atoms or a halogen atom and n is an integer of 0, 1, 2 or 3), m is an integer of 1 or 2, and X is a chlorine atom, a bromine atom, an iodine atom or $—COR^0$ (where R^0 is an alkyl group of from 1 to 4 carbon atoms or a phenyl group) when m is 1, and a group $—COO^-$ when m is 2.

4,400,509

SILYLATION PROCESS

Cornelis A. Bruynes, Koudekerk a/d Rijn, and Theodorus K. Jurriens, Delft, both of Netherlands, assignors to Gist-Brocades N.V., Delft, Netherlands

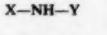
Filed Jul. 6, 1981, Ser. No. 280,350

Claims priority, application Netherlands, Jul. 4, 1980, 8003891; Sep. 5, 1980, 8005041

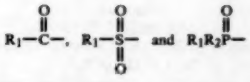
Int. Cl.³ C07D *501/04*

U.S. Cl. 544—315 **10 Claims**

1. An improved process for the trimethylsilylation of organic compounds with at least one active hydrogen atom with hexamethyldisilazane, the improvement comprising effecting the reaction in the presence of 0.001 to 10 mole percent of a catalyst of the formula



wherein X and Y are individually an electron-withdrawing group or when X is an electron-withdrawing group, Y is selected from the group consisting of hydrogen and trialkylsilyl of 1 to 6 carbon atoms or X and Y together with the nitrogen atom to which they are attached form a cyclic electron-withdrawing group the electron-withdrawing group being selected from the group consisting of



wherein R_1 and R_2 are individually selected from the group consisting of alkyl of 1 to 6 carbon atoms optionally substituted with at least one halogen, aryl optionally substituted with at least one member of the group consisting of halogen, alkyl and alkoxy of 1 to 6 carbon atoms and nitro, alkoxy of 1 to 6 carbon atoms, aryloxy optionally substituted with at least one member of the group consisting of halogen, alkyl, nitro and

R_3 and R_4 are individually selected from the group consisting of hydrogen, alkyl of 1 to 6 carbon atoms and trialkylsilyl of 1 to 6 carbon atoms and the electron-withdrawing group which forms a cyclic system together with the nitrogen atom to which they are attached have the formula —A—Z—B wherein A is

B is selected from the group consisting of

and Z is selected from the group consisting of alkylene of 1 to 6 carbon atoms, alkenylene of 2 to 6 carbon atoms and arylene, all optionally substituted with at least one member of the group consisting of halogen and alkyl.

4,400,510

A-32256 PHENAZINE ANTIBIOTIC

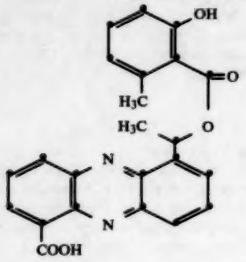
Karl H. Michel, and Marvin M. Hoehn, both of Indianapolis, Ind., assignors to Eli Lilly and Company, Indianapolis, Ind.

Division of Ser. No. 144,470, Apr. 28, 1980, Pat. No. 4,316,959. This application Sep. 21, 1981, Ser. No. 304,293

Int. Cl.³ C12P *17/12*; C07D *241/46*

U.S. Cl. 544—347 **2 Claims**

1. Antibiotic A-32256, a compound of the formula



4,400,511

2-SUBSTITUTED OCTAHYDROPYRROLO(1,2-A)-PYRAZINE-3-CARBOXYLIC ACIDS

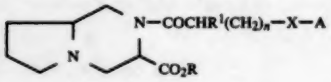
Meier E. Freed, Paoli, Pa., assignor to American Home Products Corporation, New York, N.Y.

Filed May 7, 1982, Ser. No. 375,858

Int. Cl.³ C07D *487/04*; A61K *31/495*

U.S. Cl. 544—349 **6 Claims**

1. A compound of the formula



in which

R is hydrogen, alkyl of 1 to 6 carbon atoms, phenylalkyl of 7 to 12 carbon atoms, or dialkylaminoalkyl where each alkyl group has 1 to 6 carbon atoms;

R^1 is hydrogen, alkyl of 1 to 6 carbon atoms or phenyl;

X is —S— or —NH—;

A is hydrogen, alkyl of 1 to 6 carbon atoms, alkoxycarbonylalkyl in which each alkyl moiety has 1 to 6 carbon atoms, phenylalkyl of 7 to 12 carbon atoms, phenyl(alkoxycarbonyl)alkyl in which each alkyl group has 1 to 6 carbon atoms, alkanoyl of 2 to 7 carbon atoms, benzoyl or naphthoyl;

and n is one of the integers 0, 1 or 2 or a pharmaceutically acceptable salt thereof.

4,400,512

AZASPIRO COMPOUNDS

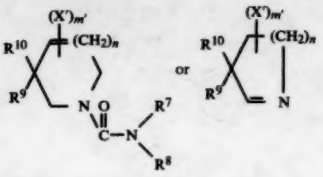
Joel Smolanoff, Chalfont, Pa., assignor to Rohm and Haas Company, Philadelphia, Pa.

Continuation-in-part of Ser. No. 29,491, Apr. 12, 1979, abandoned, which is a continuation-in-part of Ser. No. 839,159, Oct. 3, 1977, abandoned, and Ser. No. 751,932, Dec. 17, 1976, abandoned. This application Dec. 29, 1980, Ser. No. 220,560

Int. Cl.³ C07D *221/20*

U.S. Cl. 546—16 **14 Claims**

3. A compound selected from the formula:



wherein R^7 and R^8, taken together with the nitrogen atom to which they are attached, may be joined to form pyrrolidinyl, piperidyl or homopiperidyl which may be substituted with a lower alkyl, carbo lower alkoxy or ethylenedioxy; X^1 is hydrogen, lower alkyl or lower alkoxycarbonyl; R^9 and R^{10}, taken together with the carbon atom to which they are attached, are joined to form cyclopentyl, cyclohexyl, cyclononyl, cyclodecyl, cyclohexylene, cycloheptylene, cyclononlene, bicyclo-(2.2.1)-heptyl or tetrahydropyranio; m′ is an integer of from 0 to 2; n and n′ are integers each having a value of 1 to 2 and the dotted line represents an optional carbon to carbon double bond.

4. The compound of claim 3 named 2-azaspiro-[5.5]-undecyl-teteramethylene urea.

4,400,513

1-OXA-6-AZASPIRO[2.5]OCTANES

Piero Di Battista, Milan, Italy, assignor to Montedison, S.p.A., Milan, Italy

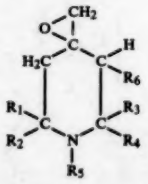
Filed Mar. 15, 1982, Ser. No. 358,488

Claims priority, application Italy, Mar. 16, 1981, 20353 A/81

Int. Cl.³ C07D *491/07*

U.S. Cl. 546—16 **7 Claims**

1. 4-spiro-oxirane derivatives of substituted piperidine having the formula:



(I)

in which

R_1, R_2, R_3, -- and R_4, either like or unlike one another, are each an alkyl radical containing 1 to 4 carbon atoms, or R_1 and R_2, and/or R_3 and R_4, together, form a cyclo-alkylene radical containing 3 to 12 carbon atoms;

R_5 is hydrogen, an alkyl, oxyalkyl or alkoxy radical containing 1 to 6 carbon atoms, an aryl or aryl-alkyl radical containing 6 to 18 carbon atoms; an alkenyl radical containing 2 to 6 carbon atoms or a $—(CH_2)_xCO_2R_7$ radical, in which X is zero or an integer from 1 to 12 and R_7 is H, a metal selected from the alkaline metals, the alkaline-earth metals, and the transition metals, an alkyl, alkylene, alkenyl, alkenylene radical, each having 1 to 20 carbon atoms; and

R_6 is hydrogen or an alkyl radical containing 1 to 4 carbon atoms.

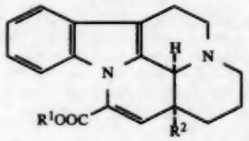
4,400,514
PROCESS FOR THE PREPARATION OF APOVINCAMINIC ACID ESTER DERIVATIVES

Csaba Szantay; Lajos Szabo; Gyorgy Kalaus; Lajos Dancsi; Tibor Keve; Ferenc Drexler, and Krisztina Mihalyfi, all of Budapest, Hungary, assignors to Richter Gedeon Vegyeszeti Gyar Rt., Budapest, Hungary

Filed Nov. 21, 1980, Ser. No. 209,265
Claims priority, application Hungary, Nov. 23, 1979, RI 735
Int. Cl.³ C07D *461/00*
U.S. Cl. 546—51 8 Claims

1. A process for the preparation of a compound of the formula (I) in racemic or optically active form

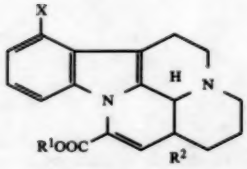
(I)



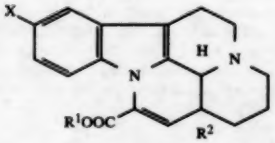
or a pharmaceutically acceptable acid addition salt thereof, wherein R^1 and R^2 are independently each C_1 to C_6 alkyl, which comprises the step of:

selectively hydrogenating at least one compound of the formula (IIa), (IIb) and (IIc)

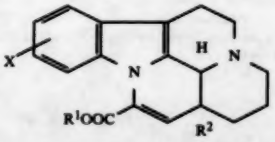
(IIa)



(IIb)



(IIc)



in a racemic or optically active form, wherein X is halogen, or a pharmaceutically acceptable acid addition salt thereof, in the presence of a hydrogenation catalyst at a temperature of 0° to 60° C., to yield the desired product.

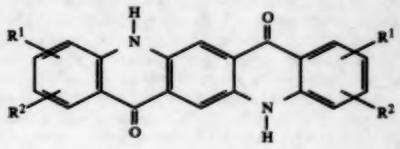
4,400,515
QUINACRIDONE MIXTURES, PROCESS FOR THEIR MANUFACTURE AND THEIR USE AS PIGMENTS

Otto Fuchs, Frankfurt am Main, and Adolf Kroh, Selters, both of Fed. Rep. of Germany, assignors to Hoechst Aktiengesellschaft, Frankfurt am Main, Fed. Rep. of Germany

Continuation of Ser. No. 79,592, Sep. 27, 1979, abandoned. This application Feb. 23, 1981, Ser. No. 237,505
Claims priority, application Fed. Rep. of Germany, Sep. 29, 1978, 2842468
Int. Cl.³ C09B *48/00*
U.S. Cl. 546—57 18 Claims

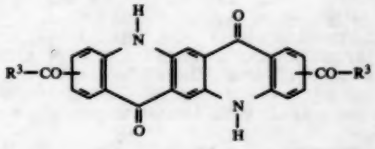
1. A composition of matter comprising 30 to 95% of at least one component of the formula (I)

(I)



wherein R^1 and R^2 are the same or different and each is hydrogen, chlorine or methyl, and 5 to 70% of at least one component of the formula (II)

(II)



wherein R^3 is —NH—R^4 or —N(R^5)$_2$, R^4 being hydrogen or alkyl of 1 to 6 carbon atoms and R^5 being methyl or ethyl.

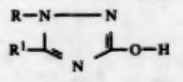
4,400,516
HETEROCYCLIC SUBSTITUTED TRIAZOLE-3-OL COMPOUNDS

Chester E. Pawloski, Bay City, Mich., assignor to The Dow Chemical Co., Midland, Mich.

Division of Ser. No. 84,697, Oct. 15, 1979, Pat. No. 4,298,602, which is a continuation-in-part of Ser. No. 951,923, Oct. 13, 1978, abandoned. This application May 4, 1981, Ser. No. 260,527
Int. Cl.³ C07D *213/02, 215/58*
U.S. Cl. 546—276 11 Claims

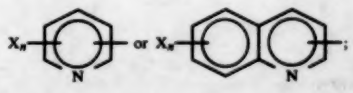
1. A compound corresponding to the formula

(IIb)



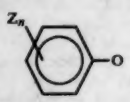
wherein R represents a nitrogen containing heterocyclic radical corresponding to the formulae

(IIc)



each X independently represents chloro, fluoro, bromo, nitro, alkyl of 1 to 4 carbon atoms, amino, mono- or dialkylamino wherein each alkyl group independently contains from 1 to 4 carbon atoms, alkoxy of 1 to 4 carbon atoms, alkylthio of 1 to 4 carbon atoms, alkylsulfinyl of 1 to 4 carbon atoms, alkylsulfo-

nyl of 1 to 4 carbon atoms, cyano, trifluoromethyl, trichloromethyl, phenoxy or substituted phenoxy of the formula



wherein each Z independently represents chloro, fluoro, bromo, nitro, cyano, alkoxy of 1 to 4 carbon atoms or alkylthio of 1 to 4 carbon atoms, with the proviso that when either n is 2 or 3, all X groups are sterically compatible with each other and all Z groups are sterically compatible with each other; Y represents oxygen or sulfur; each n can independently represent an integer of from 0 to 3, inclusive; R^1 represents hydrogen, chloro, fluoro, bromo, alkyl of 1 to 4 carbon atoms, cycloalkyl of 3 to 6 carbon atoms, phenyl, phenylthio, alkoxy of 1 to 4 carbon atoms, alkylthio of 1 to 4 carbon atoms, alkylsulfinyl of 1 to 4 carbon atoms, alkylsulfonyl of 1 to 4 carbon atoms, thiocyanato, trifluoromethyl, trichloromethyl, amino, mono- or dialkylamino wherein each alkyl group independently contains from 1 to 4 carbon atoms.

4,400,517

PHOSPHORIC ESTERS DERIVED FROM 1,2,4-TRIAZOLE HAVING AN INSECTICIDAL, NEMATOCIDAL AND ACARICIDAL ACTION, AND THEIR PREPARATION

Franco Gozzo, S. Donato Milanese; Pier M. Boschi, Piacenza, and Angelo Longoni, Milan, all of Italy, assignors to Montedison S.p.A., Milan, Italy

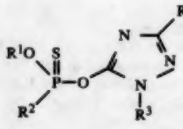
Continuation-in-part of Ser. No. 851,202, Nov. 14, 1977, Pat. No. 4,220,789. This application Jan. 29, 1980, Ser. No. 116,547

Claims priority, application Italy, Nov. 17, 1976, 29420 A/76; Mar. 3, 1977, 20855 A/76

Int. Cl.[3] **A01N** *57/16, 57/24, 57/32;* **C07F** *9/65*

U.S. Cl. 548—118 **14 Claims**

1. Compounds having the formula



wherein

R^1=alkyl with from 1 to 5 carbon atoms;

R^2=OR^1;

R^3=alkyl with from 1 to 5 carbon atoms; and

R^4=vinyl, halovinyl, polyhalovinyl, vinyl substituted with phenyl groups, alkyl groups with from 1 to 4 carbon atoms, O-alkyl groups with from 1 to 4 carbon atoms, S-alkyl groups with from 1 to 4 carbon atoms.

4,400,518

COMPOSITION OF MATTER AND PROCESS

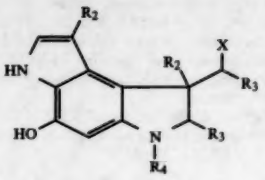
Wendell Wierenga, Kalamazoo, Mich., assignor to The Upjohn Company, Kalamazoo, Mich.

Division of Ser. No. 207,838, Nov. 18, 1980. This application Feb. 8, 1982, Ser. No. 346,465

Int. Cl.[3] **C07D** *209/56*

U.S. Cl. 548—433 **6 Claims**

1. A compound of the formula



wherein R_2 and R_3 are H, alkyl of from 1 to 5 carbon atoms, inclusive, and phenyl; R_4 is selected from the group consisting of SO_2R_2, SO_2CH_2CO phenyl, CO_2CH_2Z where Z is selected from the group consisting of CH_2I, CCl_3, $CH_2SO_2R_2$, Ph (phenyl), and fluoroenylmethyl, and X is selected from the group consisting of OSO_2R_2, Cl, Br, and I, with the proviso that R_2 can not be H when it is adjacent to SO_2.

4,400,519

BENZIL KETAL DERIVATIVES

Tsuneo Hagiwara, Hino, and Akihiro Horike, Musashino, both of Japan, assignors to Teijin Limited, Osaka, Japan

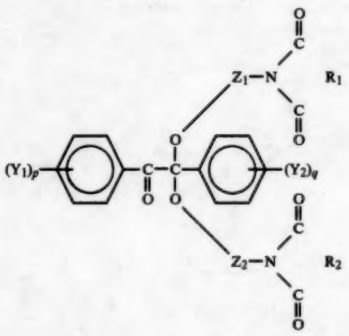
Filed Feb. 4, 1980, Ser. No. 118,238

Claims priority, application Japan, Feb. 5, 1979, 54-11374

Int. Cl.[3] **C07D** *403/12, 403/14*

U.S. Cl. 548—461 **14 Claims**

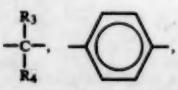
1. A benzil ketal derivative of the formula



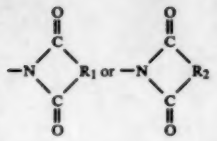
where Y_1 and Y_2 are identical or different, and each represents a group selected from the class consisting of a hydrogen atom, alkyl groups having 1 to 10 carbon atoms, aryl groups having 6 to 12 carbon atoms, alkoxy groups having 1 to 10 carbon atoms and halogen atoms; p and q, independently from each other, are integers of 1 to 3; Z_1 and Z_2 are identical or different and represent alkylene groups having 2 to 10 carbon atoms; divalent aralkylene groups having the formula:

—R—Ar—R′—

wherein R and R′ are identical or different alkylene groups having 1 to 5 carbon atoms and —R—Ar—R′— has 8 to 10 carbon atoms; and groups having the formula: $—(CH_2)_m—Q—(CH_2)_n—$ wherein Q is

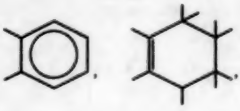


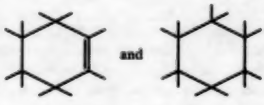
—O—, —S—, or a bond, m and n are integers from 1 to 3, R_3 and R_4 represent a hydrogen and a methyl group; and



represents a 5- membered cyclic imide group in which R_1 and R_2 are identical or different and are selected from the group consisting of:

$-CH_2-CH_2-$, $-CH=CH-$,





4,400,520

NOVEL PROCESS FOR PREPARING ISOINDOLINE DERIVATIVES

Kanji Noda, Chikushino; Akira Nakagawa; Toshiharu Motomura, both of Tosu, and Hiroyuki Ide, Fukuoka, all of Japan, assignors to Hisamitsu Pharmaceutical Co., Inc., Tosu, Japan

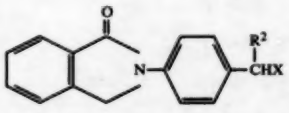
Filed Sep. 4, 1981, Ser. No. 299,432

Claims priority, application Japan, Sep. 10, 1980, 55-127526; Sep. 10, 1980, 55-127529

Int. Cl.³ C07D *209/46*

U.S. Cl. 548—472 3 Claims

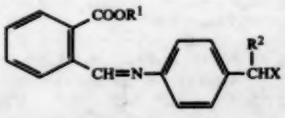
1. A process for preparing an isoindoline derivative represented by the following general formula (II)



(II)

wherein R^2 is a hydrogen atom or lower alkyl group and X is a carboxyl group, carboalkoxy group, amide group or cyano group, which comprises

cyclizing a benzylidene derivative represented by the following general formula (I)



(I)

wherein R^1 is a hydrogen atom or lower alkyl group, and R^2 and X are as defined above, in the presence of a reducing agent.

4,400,521

N-SUBSTITUTED PHENYL MALEIMIDES

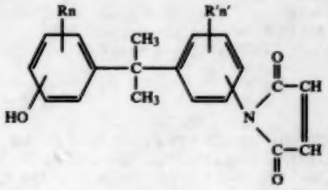
Masayuki Oba; Motoo Kawamata; Hikotada Tsuboi, and Nobuhito Koga, all of Yokohama, Japan, assignors to Mitsui Toatsu Chemicals, Incorporated, Tokyo, Japan

Filed Oct. 29, 1980, Ser. No. 201,901

Int. Cl.³ C07D *207/452*

U.S. Cl. 548—549 6 Claims

1. A maleimide compound represented by the general formula (I)



(I)

where R and R′ are a hydrogen atom, a non-sterically hindered halogen atom, or a non-sterically hindered alkyl radical of from 1 to 4 carbon atoms, and n and n′ are a whole number of from 1 to 4.

4,400,522

PREPARATION OF MALEIC ANHYDRIDE

Michael F. Lemanski, Euclid; Gregory G. Spitnale, Bedford Hts., and Ernest C. Milberger, Solon, all of Ohio, assignors to Standard Oil Company, Cleveland, Ohio

Division of Ser. No. 210,885, Nov. 28, 1980, Pat. No. 4,360,453. This application May 3, 1982, Ser. No. 374,219

Int. Cl.³ C07D *307/60*

U.S. Cl. 549—260 10 Claims

1. A process for the production of maleic anhydride by the oxidation of n-butane, n-butene, 1,3 butadiene or a mixture thereof with molecular oxygen or oxygen-containing gas in the vapor phase at a reaction temperature of 250° C.–600° C. in the presence of a catalyst containing the mixed oxides of vanadium and phosphorus, wherein the average valence state of the vanadium is about +3.5 to about +4.6 and wherein said catalyst is prepared in an organic liquid medium, including the step of extracting the solubilized catalyst precursor from the organic liquid with water to form a solubilized catalyst precursor-containing aqueous solution.

4,400,523

PROCESS FOR THE PREPARATION OF STYRYL-CYCLOPROPANECARBOXYLIC ACID ESTERS AND NEW INTERMEDIATE PRODUCTS FOR THIS PROCESS

Manfred Jautelat, Burscheid; Dieter Arlt, Cologne; Reinhard Lantzsch, Leverkusen; Rainer Fuchs, Wuppertal; Hans-Jochem Riebel, Wuppertal; Rolf Schröder, Wuppertal, and Horst Harnisch, Much, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

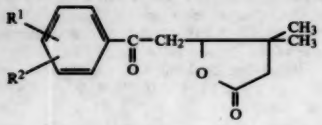
Division of Ser. No. 138,044, Apr. 7, 1980, Pat. No. 4,325,873. This application Nov. 9, 1981, Ser. No. 319,768

Claims priority, application Fed. Rep. of Germany, Apr. 23, 1979, 2916375

Int. Cl.³ C07D *307/04, 307/12*

U.S. Cl. 549—320 1 Claim

1. A compound of the formula



in which

R^1 is C_1–C_4-alkoxy, C_1–C_4-alkylthio, C_1–C_2-fluoroalkoxy, C_1–C_2-chlorofluoroalkoxy or C_1–C_2-fluoroalkylthio, and

R^2 is hydrogen or methoxy or, together with R^1, C_1–C_2-alkylenedioxy or C_1–C_2-fluoroalkylenedioxy.

4,400,524

GRIGNARD REAGENTS PREPARED FROM 5-HALOPENTAN-2-ONE PROPYLENE KETALS

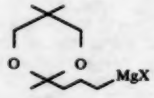
Joel E. Huber, Kalamazoo, Mich., assignor to The Upjohn Company, Kalamazoo, Mich.

Continuation-in-part of Ser. No. 287,955, Jul. 28, 1981, which is a continuation of Ser. No. 96,646, Nov. 23, 1979, abandoned, which is a division of Ser. No. 11,282, Feb. 12, 1979, abandoned. This application Sep. 15, 1981, Ser. No. 302,004

Int. Cl.³ C07D 319/06

U.S. Cl. 549—369 3 Claims

1. A compound selected from the group consisting of



wherein X is selected from the group consisting of bromine and chlorine.

4,400,525

POLYGLYCIDYL COMPOUNDS

Ichiro Minato, Kobe; Koichi Shibata, Ashiya, and Kimiya Fujinami, Takarazuka, all of Japan, assignors to Takeda Chemical Industries, Ltd., Osaka

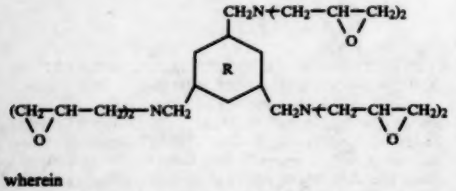
Filed Nov. 17, 1981, Ser. No. 322,205

Claims priority, application Japan, Nov. 28, 1980, 55-168373

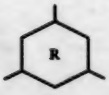
Int. Cl.³ C07D 303/36

U.S. Cl. 549—552 3 Claims

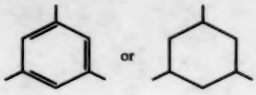
1. A polyglycidyl compound which is represented by the general formula:



wherein



represents



4,400,526

HYDROGEN BEARING SILYL CARBAMATES

Bernard Kanner, West Nyack; Curtis L. Schilling, Jr., Croton-On-Hudson, and Steven P. Hopper, Mahopac, all of N.Y., assignors to Union Carbide Corporation, Danbury, Conn.

Filed Sep. 30, 1982, Ser. No. 430,373

Int. Cl.³ C07F 7/10

U.S. Cl. 556—420 19 Claims

1. A compound selected from the group consisting of those compounds of the formula:

$$HSiR_n(O_2CNR'R'')_{3-n}$$

wherein R is a saturated or unreacted, substituted or unsubstituted alkyl, aryl, alkoxy or dialkylamino radical containing from one to twelve carbon atoms inclusive; R′ and R″ are individually selected from the group consisting of saturated or unsaturated, substituted or unsubstituted alkyl or aryl hydrocarbon radicals containing from one to twelve carbon atoms inclusive; and n has a value of from 0 to 2.

4,400,527

PRODUCING OXIMINOSILANES, OXIMINOGERMANES AND OXIMINOSTANNANES

Chempolil T. Mathew, Randolph, and Harry E. Ulmer, Morristown, both of N.J., assignors to Allied Corporation, Morris Township, Morris County, N.J.

Filed Dec. 17, 1981, Ser. No. 331,694

Int. Cl.³ C07F 7/10, 7/22, 7/30

U.S. Cl. 556—422 16 Claims

1. A process for the production of Group IVa metal oximates which comprises:

reacting in the liquid phase a Group IVa metal halide of the formula $P_{4-n}MX_n$ with an oxime compound of the formula R′R″C═NOH, at a mole ratio of oxime compound to Group IVa metal halide of at least 2n:1;

separating the product of the formula

$$(R'R''C{=}NO)_nMR_{4-n}$$

from the by-product oxime hydrohalide of the formula R′R″C═NOH.HX by separating a liquid organic phase consisting essentially of the product from a phase consisting essentially of oxime hydrohalide;

reacting the liquid organic phase consisting essentially of the product with dry base to convert oxime hydrohalide impurity to oxime compound and solid salt;

removing the solid salt from the remaining liquid;

distilling the remaining liquid to remove any unreacted oxime compound and any oxime compound formed upon reaction with dry base; and

recovering the product as the bottom after distillation;

wherein R is alkyl of 1–6 carbons, alkenyl of 2–6 carbons, aryl, aralkyl, cycloalkyl or halogen-substituted forms thereof; M is Si, Ge or Sn; X is Cl, Br or I; n is 1 to 4; and R′ and R″ are each independently H, alkyl of 1–6 carbons, aryl, cycloalkyl, aralkyl or any of them substituted by halogen, or R′ and R″ are together $(CH_2)_m$ wherein m is 3 to 7, or alkyl or halosubstituted forms thereof.

4,400,528

PROCESS FOR METHYLATING SILICON COMPOUNDS

Reinhold Artes; Volker Frey; Werner Graf, and Norbert Zeller, all of Burghausen, Fed. Rep. of Germany, assignors to Wacker-Chemie GmbH, Munich, Fed. Rep. of Germany

Filed Apr. 28, 1982, Ser. No. 372,499

Claims priority, application Fed. Rep. of Germany, May 15, 1981, 3119462

Int. Cl.³ C07F 7/08

U.S. Cl. 556—430 7 Claims

1. A process for methylating silicon compounds containing halogen and at least two silicon atoms and optionally carbon and hydrogen atoms as the only atoms in the molecule which comprises reacting an organosilicon compound containing halogen and at least two silicon atoms per molecule with tetramethylsilane in the presence of at least one organoaluminum compound of the formula

$$R_aAlY_{3-a},$$

at least one silane of the formula

$$R_b^1H_cSiCl_{4-b-c}$$

and hydrogen halide, where R is an alkyl radical having from 1 to 4 carbon atoms, R^1 is a hydrocarbon radical free of aliphatic multiple bonds having from 1 to 10 carbon atoms, Y is selected from the group consisting of hydrogen, halogen or hydrocarbon radicals which are free of aliphatic multiple bonds and contain from 1 to 10 carbon atoms and are bonded to the aluminum atom via oxygen, a is 1, 2 or 3, b is 0, 1, 2 or 3, c is 1, 2 or 3 with the proviso that the sum of b+c may not exceed 4.

4,400,529

HERBICIDE ANTIDOTE COMPOSITIONS AND METHOD OF USE

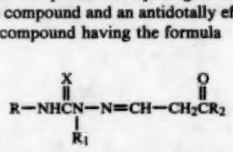
Hsiao-Ling M. Chin, Walnut Creek, Calif., assignor to Stauffer Chemical Company, Westport, Conn.

Filed Mar. 22, 1982, Ser. No. 360,292

Int. Cl.³ C07C 149/43

U.S. Cl. 560—16 19 Claims

1. A herbicidal composition comprising an active thiolcarbamate herbicide compound and an antidotally effective amount of an antidote compound having the formula



wherein R can be selected from the group consisting of alkyl groups having from about 1 to about 7 carbon atoms, aryl, and substituted aryl groups in which the substituent group can be lower alkyl having from about 1 to about 3 carbon atoms, substituted lower alkyls of from about 1 to about 3 carbon atoms in which the substituent group is halogen or nitro, lower alkoxy having from about 1 to about 3 carbon atoms; R_1 can be selected from the group consisting of hydrogen or lower alkyl having from about 1 to about 6 carbon atoms; R_2 can be selected from the group consisting of lower alkoxy having from about 1 to about 3 carbon atoms, and X is oxygen or sulfur; said compound being antidotally active with a thiolcarbamate herbicide compound and wherein said compound is present in an amount varying between about 0.0001 to 30 parts by weight for each part by weight of the active herbicidal compound.

4,400,530

PROCESS FOR PREPARING SUBSTITUTED DIPHENYL ETHERS

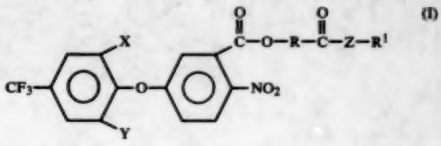
William S. Grove, deceased, late of Doylestown, Ohio, by Louise A. Grove, administratrix, assignor to PPG Industries, Inc., Pittsburgh, Pa.

Continuation-in-part of Ser. No. 163,460, Jun. 27, 1980, which is a continuation-in-part of Ser. No. 65,480, Jul. 25, 1979. This application Mar. 12, 1981, Ser. No. 243,002

Int. Cl.³ C07C 79/46

U.S. Cl. 560—21 14 Claims

1. A process for preparing a diphenyl ether of the graphic formula:



(I)

wherein:

X is hydrogen or halogen;

Y is hydrogen, halogen, cyano, trifluoromethyl, or an alkyl radical containing from 1 to 4 carbon atoms;

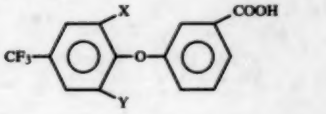
Z is oxygen or sulfur;

R is a methylidene or monosubstituted methylidene, wherein the substituent is selected from the group consisting of alkyl, oxoalkyl and hydroxyalkyl radicals containing from 1 to 4 carbon atoms; and

R^1 is hydrogen, or an alkyl radical containing from 1 to 8 carbon atoms, a cycloalkyl radical containing from 3 to 8 carbon atoms, an agronomically acceptable cationic salt, phenyl, or mono-, di-, or trisubstituted phenyl, said substituents being selected from the group consisting of halogen, alkyl or alkoxy radicals containing from 1 to 10 carbon atoms, cyano, nitro, and trifluoromethyl;

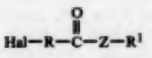
which comprises the sequential steps of:

(a) reacting a diphenyl ether of the graphic formula:



wherein X and Y are as defined above, with an inorganic alkali metal base to form the corresponding acid salt;

(b) reacting the acid salt of step (a) with an α-halocarboxylic acid ester of the graphic formula:



wherein R and Z are as defined above; R^1 is an alkyl radical containing from 1 to 8 carbon atoms, a cycloalkyl radical containing from 3 to 8 carbon atoms, phenyl, or mono-, di-, or trisubstituted phenyl, said substituents being selected from the group consisting of halogen, alkyl or alkoxy radicals containing from 1 to 10 carbon atoms, cyano, nitro, and trifluoromethyl; and Hal is selected from the group consisting of chlorine, bromine and iodine, to form the corresponding ester; and

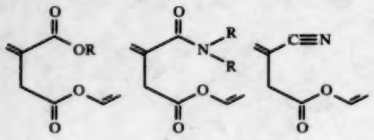
(c) nitrating the ester product of step (b) with a nitrating agent selected from the group consisting of nitric acid; mixtures of nitric acid and sulfuric acid; mixtures of potassium nitrate and sulfuric acid; and mixtures of nitric acid, sulfuric acid, and acetic anhydride, thereby to form a diphenyl ether represented by graphic Formula I.

4,400,531
4-VINYL-2-METHYLENE BUTANEDIOIC ACID COMPOUNDS

Rodney D. Bush, Cincinnati, Ohio, assignor to The Procter & Gamble Company, Cincinnati, Ohio

Filed Aug. 7, 1981, Ser. No. 290,907
Int. Cl.³ C07C *69/593, 101/20, 121/30*
U.S. Cl. 560—201 **4 Claims**

1. A compound having a formula selected from the group consisting of

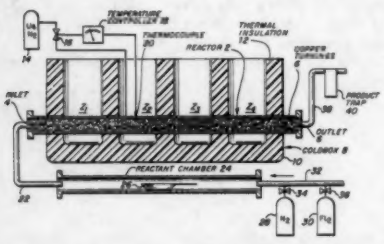


wherein R is selected from the group consisting of H, C_1–C_{18} alkyl, and C_6–C_{18} aryl.

4,400,532
CRYOGENICALLY CONTROLLED DIRECT FLUORINATION PROCESS, APPARATUS AND PRODUCTS RESULTING THEREFROM

Richard J. Lagow, Manchester; James L. Adcock, and Norma J. Maraschin, both of Cambridge, all of Mass., assignors to Massachusetts Institute of Technology, Cambridge, Mass.

Division of Ser. No. 699,291, Jun. 23, 1976, Pat. No. 4,281,119, which is a division of Ser. No. 379,876, Jul. 16, 1973, Pat. No. 4,113,345. This application Jul. 17, 1981, Ser. No. 284,584
Int. Cl.³ C07C *69/63*
U.S. Cl. 560—227 **7 Claims**



1. A process for synthesizing trifluoroacetic acid comprising:

a. fluorinating ethyl acetate by a cryogenic direct fluorination procedure to produce perfluoroethyl acetate; and,

b. hydrolyzing perfluoroethyl acetate to trifluoroacetic acid.

3. A direct fluorination process for producing trifluoroacetic acid, comprising:

a. providing a packed column fluorination reactor having a multiplicity of temperature zones independently controllable to a temperature within a range of about −190° C. to about +20° C.;

b. lowering the temperature of the first zone below the condensation point of ethyl acetate;

c. introducing ethyl acetate into said first zone while said zone is maintained at the lowered temperature whereby said ethyl acetate condenses on the column packings in said first zone;

d. introducing a source of elemental fluorine and an inert gas into said first zone, the source of elemental fluorine initially comprising a very small percentage of said mixture and which gradually rises as fluorination proceeds;

e. maintaining the temperature of said first zone until at least partial fluorination of the condensed ethyl acetate has occurred;

f. raising the temperature in said first zone to volatilize said partially fluorinated ethyl acetate and lowering the temperature in a second zone below the freezing point of said partially fluorinated ethyl acetate whereby the partially fluorinated ethyl acetate is transported to said second zone wherein it condenses on the column packings therein;

g. repeating step f until said ethyl acetate has been perfluorinated to produce perfluoroethyl acetate; and,

h. hydrolyzing said perfluoroethyl acetate to trifluoroacetic acid.

5. A cryogenic direct fluorination process comprising contacting, at a first fluorination site, a source of elemental fluorine and ethyl acetate at a temperature below the condensation point of said ethyl acetate and in the presence of a fluorination surface capable of removing heat generated during fluorination whereby said ethyl acetate is partially fluorinated, warming said first fluorination site to a temperature at which said partially fluorinated ethyl acetate volatilizes whereby it is volatilized and passes to a fresh fluorination site, lowering the temperature of said fresh fluorination site below the condensation point of said partially fluorinated ethyl acetate and contacting the partially fluorinated ethyl acetate, at said fresh site, with a source of elemental fluorine in the presence of a fluorination surface capable of removing heat generated during fluorination, repeating the warming, condensation and contacting step until said ethyl acetate is perfluorinated to produce perfluoroethyl acetate and subsequently hydrolyzing said perfluoroethyl acetate to produce trifluoroacetic acid.

4,400,533
METHOD OF PREPARING D,L-PHENYLALANINE

Helmut aus der Funten, Mondorf, and Klaus Schrage, Uthweiler, both of Fed. Rep. of Germany, assignors to Dynamit Nobel Aktiengesellschaft, Troisdorf Bez. Cologne, Fed. Rep. of Germany

Continuation of Ser. No. 172,727, Jul. 28, 1980, abandoned. This application Feb. 8, 1982, Ser. No. 346,824
Claims priority, application Fed. Rep. of Germany, Aug. 1, 1979, 2931224
Int. Cl.³ C07C *99/00*
U.S. Cl. 562—443 **11 Claims**

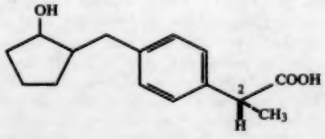
1. A method for preparing an alkali salt of d,l-phenylanine, which comprises containing an alkali salt of phenylpyruvic acid with hydrogen and ammonia at elevated pressure in the presence of a noble metal catalyst of Group VIII of the Periodic Table.

4,400,534
ANALGESIC AND ANTI-INFLAMMATORY AGENTS

Atsusuke Terada, and Eiichi Misaka, both of Hiromachi, Japan, assignors to Sankyo Company, Limited, Tokyo, Japan

Filed Dec. 17, 1981, Ser. No. 331,616
Claims priority, application Japan, Dec. 23, 1980, 55-182684
Int. Cl.³ C07C *59/00*
U.S. Cl. 562—468 **5 Claims**

1. (2S)-2-[4-(2-hydroxycyclopentan-1-ylmethyl)phenyl]propionic acid of the formula (I):



(I)

or a pharmaceutically active salt thereof.

4,400,535

ACIDIC ALKALI CITRATE AND COMPOSITIONS FOR ADJUSTING THE PH OF URINE

Rolf Madaus, Köln-Brück; Werner Stumpf; Klaus Görler, both of Bensberg-Refrath, all of Fed. Rep. of Germany, and Alfonso Carcasona-Beltran, Barcelona, Spain, assignors to Dr. Madaus & Co., Ostmerheimer, Fed. Rep. of Germany

Continuation of Ser. No. 112,994, Jan. 17, 1980, abandoned, which is a continuation of Ser. No. 916,373, Jun. 16, 1978, abandoned. This application Jan. 9, 1981, Ser. No. 223,646

Int. Cl.³ C07C *51/43, 59/265;* A61K *31/19*

U.S. Cl. 562—584 4 Claims

1. Process for preparing acidic citrate of the formula

$$K_6Na_6H_3(C_6O_7H_5)_5.2\text{–}4\ H_2O$$

comprising the steps of dissolving tripotassium citrate .H_2O, trisodium citrate.2 H_2O and citric acid in a mole ratio 2:2:1 together in 3 to 5 times the quantity by weight of boiling demineralized water, based on the weight of the citric acid, while maintaining the temperature of the solution at not lower than 60° C., dissolving citric acid in 0.5 to 1 times its quantity by weight of demineralized water, based on the weight of the citric acid inserted, at 90° C., then adding sodium carbonate and potassium carbonate in solid form to give a mole ratio of 3:3:5 of sodium carbonate, potassium carbonate and citric acid; and

quick drying the homogeneous solution by contact with a hot surface at 140° C. to 160° C. for about 5 seconds.

4,400,536

BENZYLIDENE DERIVATIVES

Jean-Pierre Kaplan, Chevilly Larue, and Bernard Raizon, Vigneux, both of France, assignors to Synthelabo, Paris, France

Filed Feb. 11, 1981, Ser. No. 233,404

Claims priority, application France, Feb. 12, 1980, 80 03009

Int. Cl.³ C07C *119/14*

U.S. Cl. 564—269 2 Claims

1. 2-[Butylimino-(2-chlorophenyl)-methyl]-4-chlorophenol.

2. 2-[Butylimino-(2,4-dimethylphenyl)-methyl]-4,6-dimethylphenol.

4,400,537

PROCESS FOR 1,4-PHENYLENEDIAMINE

Thomas A. Weil, Naperville, Ill., assignor to Standard Oil Company (Indiana), Chicago, Ill.

Continuation-in-part of Ser. No. 247,362, Mar. 25, 1981, abandoned, which is a continuation of Ser. No. 837,537, Sep. 28, 1977, abandoned. This application Apr. 19, 1982, Ser. No. 369,499

Int. Cl.³ C07C *85/06*

U.S. Cl. 564—402 8 Claims

1. A process for the amination of a hydroxy aromatic selected from the group consisting essentially of 1,4-dihydroxybenzene and p-aminophenol which comprises reacting said hydroxy aromatic with an aminating agent in the presence of an inert liquid hydrocarbon with a boiling point in the range of from about 25° C. to 400° C., and an alumina catalyst selected from the group consisting of alpha alumina, gamma alumina and eta alumina catalysts at a temperature within the range of from about 300° C. to 450° C., a pressure from atmospheric to about 3000 psig wherein the concentration of said catalyst is within the range of from about 1:1 to about 1:10, weight of hydroxy aromatic to weight of catalyst and the mole ratio of aminating agent as ammonia to reactant is at least 20:1, aminating agent to reactant.

4,400,538

FIXED BED CATALYST FOR MNB AND DNT HYDROGENATION

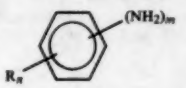
David H. Chadwick, New Martinsville, W. Va., and Thomas E. Boyd, Boulder, Colo., assignors to Mobay Chemical Corporation, Pittsburgh, Pa.

Filed Jun. 11, 1981, Ser. No. 272,629

Int. Cl.³ C07C *85/11*

U.S. Cl. 564—423 4 Claims

1. In a process for the production of an aromatic amino compound of the formula:



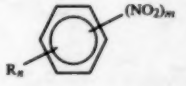
wherein

R is an alkyl substituent of from 1 to about 18 carbon atoms,

m is an integer of from 1 to 3, and

n is an integer of from 0 to 5,

comprising subjecting a nitro compound of the formula;



wherein R, m, and n are as defined above, to gaseous hydrogen in the presence of a catalyst, the improvement wherein said catalyst is an activated noble metal in the form of a screen.

4,400,539

PROCESS FOR THE MANUFACTURE OF ETHYLENEDIAMINE

Charles A. Gibson, and John R. Winters, both of South Charleston, W. Va., assignors to Union Carbide Corporation, Danbury, Conn.

Filed Sep. 30, 1981, Ser. No. 307,215

Int. Cl.³ C07C *85/06, 89/02*

U.S. Cl. 564—480 8 Claims

1. A continuous process for the manufacture of ethylenediamine which comprises:

(A) providing (1) a continuous homogeneous fluid stream under pressure, which stream comprises ammonia, monoethanolamine, diethanolamine and triethanolamine as produced by the direct reaction of ethylene oxide and ammonia in which the number of moles of ammonia substantially exceeds the molar concentration of alcoholic hydroxyl groups present in such steams; (2) a continuous recycle stream consisting essentially of monoethanolamine; (3) an amination zone comprising a solid amination catalyst; and (4) a separation zone for separating monoethanolamine from the amination product stream removed from the amination zone which monoethanolamine forms said recycle stream;

(B) feeding said recycle stream under pressure to said fluid stream to form a continuous amination feed stream under pressure;

(C) feeding the amination feed stream to the amination zone under sufficient pressure to assure flow through the amination zone but at lower pressure than said homogeneous fluid stream and to form an amination product stream containing ethylenediamine therein;

(D) separating monoethanolamine from the amination product stream to form said recycle stream; and

(E) continuously recovering ethylenediamine from said amination product stream; wherein said amination feed stream contains at least 70 weight percent monoethanolamine, based on the weight of the ethanolamines therein; the moles of ammonia in the amination feed stream ex-

ceeds the molar concentration of alcoholic hydroxyl groups in said amination feed stream; and the amination feed stream contains at least a 5% increase in the concentration of monoethanolamine over that contained in said fluid stream.

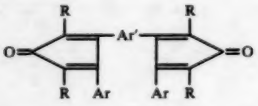
4,400,540

OXY AND THIOARYL-PHENYLATED AROMATIC BISCYCLOPENTADIENONES

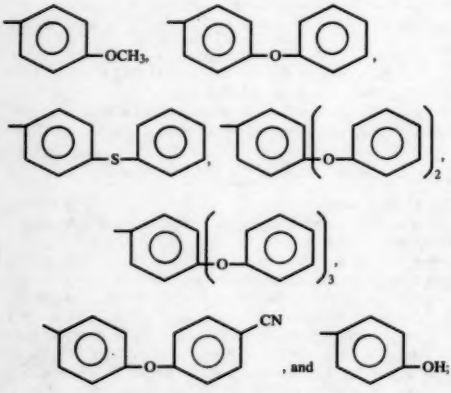
Bruce A. Reinhardt, New Carlisle, and Fred E. Arnold, Centerville, both of Ohio, assignors to The United States of America as represented by the Secretary of the Air Force, Washington, D.C.

Filed Apr. 8, 1982, Ser. No. 366,733
Int. Cl.³ C07C *49/792*
U.S. Cl. 568—31 **3 Claims**

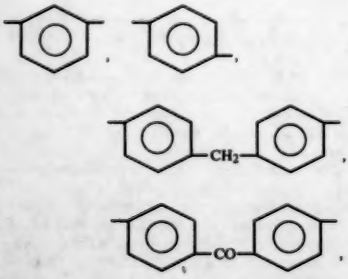
1. An aromatic biscyclopentadienone having the general formula



wherein Ar is a monovalent aromatic radical selected from the group consisting of



Ar' is a divalent aromatic radical selected from the group consisting of



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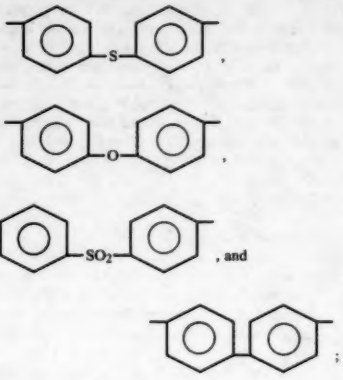
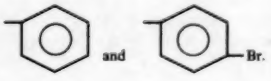


and R is a monovalent aromatic radical selected from the group consisting of



4,400,541

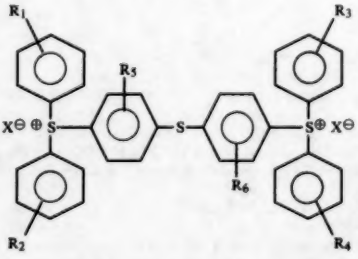
PROCESS FOR PREPARING BIS-(DIPHENYLSULFONIOPHENYL)-SULFIDE BIS-CHLORIDE

Shankar S. Iyer, Hackettstown, N.J., assignor to The Southland Corporation, Dallas, Tex.

Filed Feb. 1, 1982, Ser. No. 344,718
Int. Cl.³ C07C *149/46*
U.S. Cl. 568—56 **5 Claims**

1. A process of preparing an aryl sulfonium halide of the formula:

(Formula I)



wherein X is chlorine, bromine or fluorine, and R_1, R_2, R_3, R_4, R_5 and R_6 are independently hydrogen, halogen, a carboxy, a phenyl or a halo-substituted phenyl, said process comprising the sequential steps of:

(1) reacting a diaryl disulfide of the formula: Aryl-S-S-Aryl and aluminum chloride with a stoichiometric excess of benzene in a non-reactive organic solvent to form a reaction mixture;

(2) bubbling a gaseous halogen X, as defined above, into the reaction mixture; and

(3) removing the aryl sulfonium halide product of Formula I thus produced.

4,400,542

SYNTHESIS OF SUBSTITUTED PHENOLS

David K. Rainey, and Michael M. Fanthorpe, both of Loughborough, England, assignors to Fisons Limited, London, England

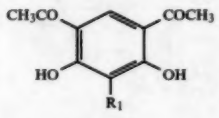
Continuation of Ser. No. 97,337, Nov. 26, 1979, abandoned. This application Apr. 22, 1981, Ser. No. 256,295

Claims priority, application United Kingdom, Dec. 5, 1978, 47180/78

Int. Cl.³ C07C *45/68, 41/835*

U.S. Cl. 568—315 6 Claims

1. A process for the production of a compound of formula I,



in which R_1 is alkyl C 1 to 6,

which comprises reacting 4,6-diacetyl resorcinol with an alkyl C 1 to 6- bromide or iodide in a polar hydrogen bonding solvent at a temperature of from 20° to 120° C.

4,400,543

3-PHENYL-4-BENZOYL-1,2-DIHYDRONAPHTHALENES

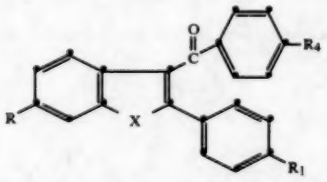
Tulio Suarez, and C. David Jones, both of Indianapolis, Ind., assignors to Eli Lilly and Company, Indianapolis, Ind.

Division of Ser. No. 148,640, May 12, 1980, Pat. No. 4,323,707, which is a division of Ser. No. 930,639, Aug. 3, 1978, Pat. No. 4,230,862, which is a continuation of Ser. No. 761,930, Jan. 24, 1977, abandoned, which is a continuation-in-part of Ser. No. 724,202, Sep. 17, 1976, abandoned, which is a continuation-in-part of Ser. No. 625,991, Oct. 28, 1975, abandoned. This application Feb. 1, 1982, Ser. No. 344,332

Int. Cl.³ C07C *49/82*

U.S. Cl. 568—327 3 Claims

1. A compound of the formula



in which X is —CH_2—CH_2— or —CH=CH—; R is hydrogen, hydroxyl, or C_1–C_5 alkoxy; R_1 is hydrogen, hydroxyl, or C_1–C_5 alkoxy; and R_4 is hydroxyl.

4,400,544

METHOD FOR THE PREPARATION OF CYCLOHEXANONE

Katsuomi Takehira, Yatabe; Toshio Ishikawa, Tokyo; Takashi Hayakawa, Yatabe, and Juichi Imamura, Chofu, all of Japan, assignors to Director-General of the Agency of Industrial Science and Technology, Tokyo, Japan

Filed Jan. 22, 1982, Ser. No. 341,758

Claims priority, application Japan, Mar. 20, 1981, 56-42114

Int. Cl.³ C07C *45/34*

U.S. Cl. 568—360 7 Claims

1. A method for the preparation of cyclohexanone by liquid-phase oxidation of cyclohexene which comprises reacting, at a temperature from room temperature to about 200° C. and at a pressure from atmospheric pressure to about 30 Kg/cm², a liquid reaction mixture comprising benzene and/or cyclohexane, and cyclohexene and an aliphatic alcohol having from 2 to 10 carbon atoms in a molecule with an oxidizing gas in the presence of 0.001 to 10% by weight of palladium chloride as a main catalytic ingredient and 0.01 to 20% by weight of a chloride of copper or iron as a co-catalytic ingredient, based on the amount of cyclohexene in the reaction mixture, and wherein the amount of benzene and/or cyclohexane does not exceed 10 times by volume the amount of the cyclohexene in the reaction mixture.

4,400,545

ALICYCLIC KETONE AND ALCOHOL DERIVATIVES

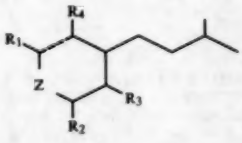
Brian J. Willis, Bergenfield, N.J.; Robert G. Eilerman, Merrick, N.Y., and John M. Yurecko, Jr., Bayonne, N.J., assignors to Fritzsche Dodge & Olcott Inc., New York, N.Y.

Division of Ser. No. 194,967, Oct. 8, 1980, Pat. No. 4,326,997. This application Nov. 30, 1981, Ser. No. 326,076

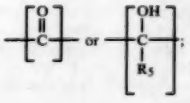
Int. Cl.³ C07C *49/403, 31/135*

U.S. Cl. 568—377 14 Claims

1. A compound having the structure:



wherein the dotted line represents either a carbon-carbon double bond or a carbon-carbon single bond; wherein Z is either



and wherein each of R_1, R_2, R_3, R_4, and R_5 is hydrogen or C_1 to C_4 alkyl.

4,400,546

PROCESS FOR THE PREPARATION OF HEXAFLUOROACETONE AND DIRECT USE OF THE SOLUTION OBTAINED BY THE PROCESS

Peter-Paul Rammelt, and Günter Siegemund, both of Hofheim am Taunus, Fed. Rep. of Germany, assignors to Hoechst Aktiengesellschaft, Frankfurt am Main, Fed. Rep. of Germany

Filed Dec. 9, 1981, Ser. No. 328,818

Claims priority, application Fed. Rep. of Germany, Dec. 11, 1980, 3046604

Int. Cl.³ C07C *45/58*

U.S. Cl. 568—386 6 Claims

1. In a process for the preparation of hexafluoroacetone by conversion of hexafluoropropene epoxide the improvement which comprises reacting hexafluoropropene epoxide with at least a catalytic amount of hydrogen fluoride as catalyst.

4,400,547

HYDROFORMYLATION PROCESS UTILIZING AN UNMODIFIED RHODIUM CATALYST AND THE STABILIZATION AND REGENERATION THEREOF

John L. Dawes, Longview, Tex., and Thomas J. Devon, Kingsport, Tenn., assignors to Eastman Kodak Company, Rochester, N.Y.

Filed Apr. 10, 1981, Ser. No. 252,753
Int. Cl.³ C07C 45/50
U.S. Cl. 568—454 16 Claims

1. A hydroformylation process comprising contacting at least one olefin of from 2 to 20 carbon atoms in a reaction zone at a temperature of from about 20° C. to about 300° C. and a pressure of from about 15 psig to about 10,000 psig with hydrogen, carbon monoxide and a catalyst consisting essentially of unmodified rhodium for a sufficient period of time to produce aldehyde product, contacting reactor effluent with at least one ligand selected from trimethylphosphite, triethylphosphite, butyldiethylphosphite, tri-n-propylphosphite, tri-n-butylphosphite, tri-2-ethylhexylphosphite, tri-n-octylphosphite, tri-n-dodecylphosphite, triphenylphosphite, trinaphthylphosphite, triphenylphosphine, tri(p-chlorophenyl)phosphite, trinaphthylphosphine, phenyldiphenylphosphinite, diphenylphenylphosphonite, diphenylethylphosphonite, triphenylarsine, triphenylstibine, tris(p-chlorophenyl)phosphine, tri(p-cyanophenyl)phosphite, tri(p-methoxyphenyl)phosphite, and ethyldiphenylphosphinite, and separating said product from said effluent in a distillation zone at a temperature of about 120° C. or less to leave a base product.

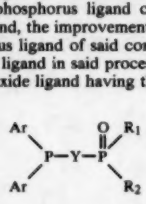
4,400,548

HYDROFORMYLATION PROCESS USING BISPHOSPHINE MONOOXIDE LIGANDS

Anthony G. Abatjoglou, and Ernst Billig, both of Charleston, W. Va., assignors to Union Carbide Corporation, Danbury, Conn.

Filed Aug. 17, 1981, Ser. No. 293,190
Int. Cl.³ C07C 45/50
U.S. Cl. 568—454 9 Claims

1. In a process for producing aldehydes by the hydroformylation of an olefinically unsaturated compound with carbon monoxide and hydrogen in a reaction medium which contains a soluble rhodium-phosphorus ligand complex catalyst and free phosphorus ligand, the improvement comprising employing as the phosphorus ligand of said complex catalyst and as the free phosphorus ligand in said process an organic tertiary bisphosphine monooxide ligand having the general formula:



wherein each Ar group represents an identical or different substituted or unsubstituted aryl radical, each R_1 and R_2 group represents an identical or different substituted or unsubstituted monovalent hydrocarbon radical and Y represents a divalent bridging group.

4,400,549

HYDROFORMYLATION OF OLEFINICALLY UNSATURATED COMPOUNDS

Wolfgang Richter, Ludwigshafen; Rudolf Kummer, Frankenthal, and Kurt Schwirten, Ludwigshafen, all of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Fed. Rep. of Germany

Filed Nov. 23, 1981, Ser. No. 324,277
Claims priority, application Fed. Rep. of Germany, Dec. 9, 1980, 3046355
Int. Cl.³ C07C 45/50
U.S. Cl. 568—454 3 Claims

1. A process for hydroformylating olefinically unsaturated compounds by means of rhodium/triphenylphosphine/carbonyl complexes formed in situ from rhodium acetate, triphenylphosphine and carbon monoxide, wherein the hydroformylation reaction is preceded by a starting phase in which the mixture of the hydroformylation medium, the triphenylphosphine and rhodium acetate is heated at from 90° to 120° C. under a CO/H_2 pressure of from 5 to 20 bar and the acetic acid liberated is discharged from the reactor in gaseous form in a stream of CO and H_2, until virtually no more acetic acid can be detected in this gaseous discharge.

4,400,550

SYNTHESIS OF THE NAVEL ORANGE WORM PHEROMONE (Z,Z)-11,13-HEXADECADIENAL

Clyde E. Bishop, Dublin, and Gary W. Morrow, Columbus, both of Ohio, assignors to Albany International Corp., Albany, N.Y.

Filed Feb. 12, 1982, Ser. No. 348,501
Int. Cl.³ C07C 47/21
U.S. Cl. 568—486 3 Claims

1. A process for preparing (Z,Z)-11,13-hexadecadienal, which comprises;

halogenating undecylenic alcohol at a temperature below room temperature to obtain 10,11-dihalo-1-undecanol;

dehydrohalogenating the 10,11-dihalo-1-undecanol by reaction with a strong base to obtain 10-undecyn-1-ol;

chlorinating the 10-undecyn-1-ol to obtain 11-chloro-1-undecyne;

converting the 11-chloro-1-undecyne to the 11-chlorododecyne Grignard reagent;

complexing the Grignard reagent with acrolein at a temperature of from about 15° to about 30° C.;

hydrolyzing the complex to obtain 14-chloro-1-tetradecen-4-yn-3-ol;

acylating the 14-chloro-1-tetradecen-4-yn-3-ol with an acyl radical of the formula

wherein R represents hydrocarbyl;

reacting the acylate with methylmagnesium bromide in the presence of a catalytic proportion of cuprous ion to obtain 15-chloro-(Z)-3-pentadecen-5-yne at a temperature of less than about −30° C.;

reducing the 15-chloro-(Z)-3-pentadecen-5-yne to 15-chloro-(Z,Z)-3,5-pentadecadiene at a temperature of from about −20° C. to room temperature by hydroboration of the 15-chloro-(Z)-3-pentadecen-5-yne followed by protonolysis of the product borane;

converting the 15-chloro-(Z,Z)-3,5-pentadecadiene to the (Z,Z)-11,13-hexadecadienal dialkyl acetal by reaction with a compound of the formula

wherein R is as previously defined; and

cleaving the acetal to obtain the (Z,Z)-11,13-hexadecadienal by acid hydrolysis of the acetal.

4,400,551
PROCESS FOR THE PRODUCTION OF ACETALDEHYDE AND ETHANOL

Karl-Heinz Keim, Heimerzheim, and Joachim Korff, Bernheim-Sechtem, both of Fed. Rep. of Germany, assignors to Union Rheinische Braunkohlen Kraftstoff Aktiengesellschaft, Wesseling, Fed. Rep. of Germany

Filed Aug. 19, 1981, Ser. No. 294,293

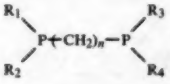
Claims priority, application Fed. Rep. of Germany, Aug. 21, 1980, 3031558

Int. Cl.³ C07C *45/49*

U.S. Cl. 568—487 **9 Claims**

1. In a process for the production of acetaldehyde and ethanol by reacting methanol with carbon monoxide and hydrogen at a temperature of between 100°–250° C. and under elevated pressure in the presence of a catalyst containing cobalt, an iodine and/or bromine compound and a phosphorus-containing ligand,

the improvement which comprises reacting methanol with carbon monoxide and hydrogen under a pressure of from 200 to 450 bar in the presence of a catalyst containing cobalt, a halogen compound selected from the group consisting of hydrogen iodide and hydrogen bromide, using 0.009 to 0.0005 mole of hydrogen iodide and/or hydrogen bromide per mole of methanol used, and a biphosphine of the formula



wherein R_1 to R_4 are each alkyl of 1–12 carbon atoms, alkoxy of 1–12 carbon atoms, alkylamine of 1–12 carbon atoms, aryl, aroxyl or arylamine each of 6 carbon atoms unsubstituted or substituted by alkyl of 1 to 6 carbon atoms, monocyclic rings of 5 to 12 carbon atoms or bicyclic rings of 10 to 20 carbon atoms, and

n is the integer from 1 to 6.

4,400,552
METHOD FOR DECOMPOSITION OF HALOGENATED ORGANIC COMPOUNDS

Louis L. Pytlewski; Kenneth Krevitz, both of Philadelphia, Pa., and Arthur B. Smith, Littleton, Colo., assignors to The Franklin Institute, Philadelphia, Pa.

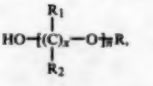
Continuation-in-part of Ser. No. 142,865, Apr. 21, 1980, abandoned. This application Mar. 5, 1981, Ser. No. 240,622

Int. Cl.³ C07C *33/34, 37/01*

U.S. Cl. 568—715 **18 Claims**

1. A method for the decomposition of a halogenated organic compound, comprising the steps of:

(a) providing a decomposition reagent formed by reacting an alkali metal hydroxide, a reactant having the general formula:



wherein R is hydrogen or lower alkyl, R_1 and R_2 are the same or different and are selected from the group consisting of hydrogen, unsubstituted or substituted lower alkyl, unsubstituted or substituted cycloalkyl having from 5 to 8 carbon atoms, and unsubstituted or substituted aryl, n has a value from about 2 to about 400 and x has a value or at least 2, and oxygen, said reagent containing an amount of water, said amount of water not exceeding about 20 weight percent of said reagent and

(b) reacting said decomposition reagent with the halogenated organic compound at a temperature of no more than 120° C. to effect at least about 85% dehalogenation of said halogenated organic compound and form an oxygenated derivative of said compound.

4,400,553
RECOVERY OF BPA AND PHENOL FROM AQUEOUS EFFLUENT STREAMS

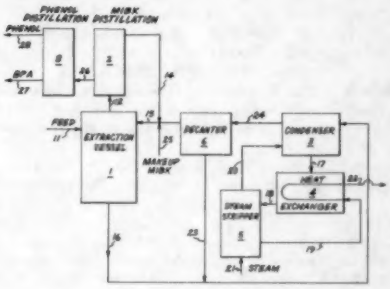
Viney P. Aneja, Schenectady, N.Y., assignor to General Electric Company, Schenectady, N.Y.

Filed Jun. 24, 1981, Ser. No. 276,625

The portion of the term of this patent subsequent to Feb. 15, 2000, has been disclaimed.

Int. Cl.³ C07C *37/72*

U.S. Cl. 568—724 **12 Claims**



1. A continuous process for simultaneously extracting BPA and phenol from the aqueous effluent streams produced in the aqueous purification of BPA comprising: introducing an aqueous effluent stream containing BPA and phenol to an extraction vessel along with MIBK, removing the heavy aqueous phase from said extraction vessel for further processing or disposal, removing from the top of said extraction vessel an MIBK solution of BPA and phenol, recovering the BPA and phenol solution from said MIBK solution of BPA and phenol and recycling the MIBK to said extraction vessel and, separating the BPA and phenol for recovery or recycling.

4,400,554
PROCESS FOR MAKING BIS(HYDROXYPHENYL)METHANES

Morris R. Ort, Wilbraham, Mass., assignor to Monsanto Company, St. Louis, Mo.

Filed Mar. 29, 1982, Ser. No. 362,719

Int. Cl.³ C07C *39/16*

U.S. Cl. 568—727 **13 Claims**

1. A process for producing bis(hydroxyphenyl)methanes which comprises reacting phenol and formaldehyde at a temperature in the range of about 10 to about 60° C. in a two phase mixture containing at least about 3 moles of phenol per mole of formaldehyde and an aqueous solution of phosphoric acid containing less than about 2 mole of phosphoric acid per mole of phenol and from about 1.5 to about 6.0 moles of water per mole of phosphoric acid to produce bis(hydroxyphenyl)methanes and separating the organic phase containing the bis(hydroxyphenyl)methanes from the aqueous phase.

4,400,555

ION EXCHANGE CATALYZED BISPHENOL SYNETHESIS

Ashok K. Mendiratta, Schenectady, N.Y., assignor to General Electric Company, Schenectady, N.Y.

Filed Oct. 6, 1981, Ser. No. 309,144
Int. Cl.³ C07C 39/16
U.S. Cl. 568—728 7 Claims

1. A process for the preparation of bisphenol-A comprising reacting 5–10 moles of phenol per mole of acetone at a temperature of about 50° C. to about 120° C. in the presence of a cation exchange resin catalyst in a series of reactors wherein all of said phenol and from about 25% to about 75% by weight of said acetone necessary for the reaction is charged to a first reactor and the remainder of said acetone is charged to a subsequent reactor whereby a reduction in color bodies and by-products in the bisphenol-A effluent is achieved and the ratio of phenol to acetone necessary to produce an optimized yield of bisphenol-A is reduced.

4,400,556

CATALYST FOR REDUCING FORMATION OF CHLORINATED DIOXINS IN MANUFACTURE OF CHLORINATED PHENOLS

William H. Wetzel, Federal Way; Hsi-Lung Pan, Seattle; Robert J. Goodwin, Puyalup, and John E. Wilkinson, Gig Harbor, all of Wash., assignors to Reichhold Chemicals, Incorporated, White Plains, N.Y.

Division of Ser. No. 157,447, Jun. 9, 1980, Pat. No. 4,294,996.
This application Jun. 22, 1981, Ser. No. 276,003
Int. Cl.³ C07C 39/26
U.S. Cl. 568—776 2 Claims

1. A catalyst used in a process of producing polychlorinated phenols having reduced amounts of chlorinated dioxin formed during the reaction of phenol or lower chlorinated phenols, or mixtures thereof, with chlorine, said catalyst selected from a group consisting of zirconium tetrachloride or hafnium tetrachloride or mixtures thereof, by reacting at a temperature of from 10° C. to 190° C. a phenol selected from the group consisting of phenols and lower chlorophenols and mixtures thereof, and chlorine to form a reaction mixture in the presence of from about 0.005 to about 0.016 moles per mole of said catalyst.

4,400,557

PROCESS FOR THE O-SUBSTITUTION OF PHENOLS

Max Fremery, Wesseling, and Joachim Korff, Bornheim-Sechtem, both of Fed. Rep. of Germany, assignors to Braunkohlen Kraftstoff Aktiengesellschaft, Wesseling, Fed. Rep. of Germany

Filed May 14, 1981, Ser. No. 263,770
Claims priority, application Fed. Rep. of Germany, Feb. 4, 1981, 3103665
Int. Cl.³ C07C 37/16
U.S. Cl. 568—804 6 Claims

1. In a process for the production of o-substituted phenols by catalytically reacting phenols having at least one free o-position with alcohols or ethers in the presence of a catalyst containing iron oxide at an elevated temperature in the gaseous phase, the improvement which comprises reacting a compound selected from the group consisting of phenol, monoalkyl phenol, and di-alkyl phenol with methanol or dimethyl ether in a molar ratio of 1:0.1–10 at a temperature of between 270° C.–390° C. for 0.05 to 10 seconds in the gaseous phase in the presence of a four component catalyst consisting essentially of (a) iron oxide, (b) vanadium oxide, (c) at least one oxide of a metal of the group consisting of boron, aluminum, titanium, zirconium, silicon, germanium, tin and lead, and (d) at least one oxide of a metal of the group consisting of an alkali metal, an alkaline-earth metal, lanthanum and manganese when component (c) is an oxide of silicon or when component (c) is an oxide other than silicon, component (d) is at least one oxide of a metal of the group consisting of calcium, strontium, barium, an alkali metal and lanthanum.

4,400,558

RECOVERY OF 2-PHENYLETHANOL

Margaret I. Nemet-Mavrodin, Robbinsville, and John F. White, Princeton, both of N.J., assignors to Atlantic Richfield Company, Los Angeles, Calif.

Filed Apr. 17, 1981, Ser. No. 255,011
Int. Cl.³ C07C 29/88
U.S. Cl. 568—810 16 Claims

1. A method for the recovery of 2-phenylethanol from an aromatic-rich distilland product obtained from the process for the production of an oxirane compound by the oxidation of ethylbenzene to produce an ethylbenzene hydroperoxide product mixture, reacting said ethylbenzene hydroperoxide product mixture with an olefinically unsaturated compound to produce an epoxidation reaction product comprising primarily said oxirane compound, acetophenone, methylbenzyl alcohol and up to about 20 weight percent of 2-phenylethanol and separating said oxirane compound and unreacted reactants from said reaction product, thereby obtaining said aromatic-rich distilland product, said method comprising:

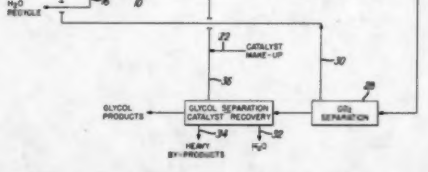
(a) adjusting the composition of said distilland product to produce a feedstock comprising about 20 to 80 weight percent 2-phenylethanol and about 10 to 70 weight percent methylbenzyl alcohol;
(b) diluting the product obtained in step (a) with an organic diluent in an amount sufficient to produce a complexation feed solution, said diluent being inert to and not capable of complexing with the initial halide employed in step (c) below;
(c) forming an insoluble metal halide-2-phenylethanol adduct by contacting said complexation feed solution with a substantially anhydrous metal halide;
(d) separating said adduct from said solution; and
(e) decomposing said adduct to obtain a 2-phenylethanol product.

4,400,559

PROCESS FOR PREPARING ETHYLENE GLYCOL

Vijay S. Bhise, Bloomfield, N.J., assignor to The Halcon SD Group, Inc., New York, N.Y.

Filed Jun. 14, 1982, Ser. No. 388,395
Int. Cl.³ C07C 31/20
U.S. Cl. 568—858 9 Claims



1. A process for the preparation of ethylene glycol from an aqueous solution of ethylene oxide comprising the steps of:

(a) contacting said aqueous solution of ethylene oxide with sufficient carbon dioxide at near-critical or super-critical conditions to extract substantially all of the ethylene oxide into the carbon dioxide and forming an ethylene oxide-rich carbon dioxide phase containing a minor amount of water and an ethylene oxide-lean aqueous phase;
(b) contacting said ethylene oxide-rich carbon dioxide phase of (a) with a carbonation catalyst under carbonation con-

ditions to form an ethylene carbonate-rich carbon dioxide stream;

(c) adding water to the catalyst-containing ethylene carbonate-rich stream of (b) and hydrolyzing said ethylene carbonate to ethylene glycol and carbon dioxide;

(d) flashing off from the ethylene glycol-containing stream of (c) the carbon dioxide formed in the hydrolysis and returning said carbon dioxide to the (near) super-critical extraction of (a);

(e) separating the ethylene glycol from the flashed stream of (d); and

(f) recovering and recycling to the carbonation reaction the catalyst added in (b).

4,400,560

PROCESS FOR THE PREPARATION OF A MIXTURE OF LOW-MOLECULAR WEIGHT POLYHORIC ALCOHOLS

Roland Richter, Leverkusen; Hanns P. Müller, Odenthal; Kuno Wagner, Leverkusen; Rudolf Helm, Bergisch Gladbach, and Jürgen Zander, Leverkusen, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Filed Mar. 9, 1981, Ser. No. 242,076

Claims priority, application Fed. Rep. of Germany, Mar. 14, 1980, 3009847

Int. Cl.³ C07C *31/18*

U.S. Cl. 568—863 11 Claims

1. A process for preparing a mixture of low-molecular weight polyhydroxyl compounds by catalytically hydrogenating a formose mixture with hydrogen on a metal catalyst at elevated temperature and pressure and at a pH of 7.5 to 12.5 in which

(a) the formose mixture comprises:

(i) up to 70 wt. % formose,

(ii) up to 1.6 wt. % lead ions, and

(iii) up to 5 wt. % calcium ions

with at least one of (ii) or (iii) being present; and

(b) the catalyst which is present in an amount of 4–240 wt. % (based on formose solution) is a compound taken from the group consisting of nickel, cobalt and compounds thereof.

4,400,561

CATALYTIC CONVERSION

Thomas O. Mitchell, Trenton, and Darrell D. Whitehurst, Titusville, both of N.J., assignors to Mobil Oil Corporation, New York, N.Y.

Continuation-in-part of Ser. No. 110,436, Jan. 7, 1980, abandoned, which is a continuation-in-part of Ser. No. 973,658, Dec. 27, 1978, abandoned, which is a continuation-in-part of Ser. No. 819,026, Jul. 25, 1977, abandoned, which is a continuation-in-part of Ser. No. 681,883, Apr. 30, 1976, abandoned, which is a continuation-in-part of Ser. No. 443,557, Feb. 19, 1974, Pat. No. 3,980,583. This application Dec. 10, 1981, Ser. No. 329,480

Int. Cl.³ C07C *29/00, 27/20, 33/22*

U.S. Cl. 568—902 18 Claims

1. A process for the conversion of a feedstock comprising carbon monoxide, hydrogen, alcohol of from 1 to about 20 carbon atoms per molecule and olefin of from 2 to about 20 carbon atoms per molecule to product comprising an olefin having a higher boiling point than said feedstock olefin and an alcohol having a higher boiling point than said feedstock alcohol which comprises contacting said feedstock under conversion conditions including a temperature of from about 100° C. to about 400° C., a pressure of from about 0.1 atmosphere to about 10,000 atmospheres, a contact time of from about 1.0 second to about 100 hours and a hydrogen/CO mole ratio of from about 0.2 to about 5 with a catalyst comprised of a substrate of a porous refractory oxide having surface hydroxyl groups, a minimum surface area of about 10 m^2/g and pores with a minimum pore diameter of about 5 Angstrom Units, said substrate being modified by at least one amine functional member, containing the element silicon, coordinated to a metal function of a transition metal selected from the group consisting of Group VIII metals of the Period Table of Elements, said amine functional member acting as a bridging member between said substrate and said metal function, as a ligand covalently bonded to said substrate.

4,400,562

ALKENOL SYNTHESIS

Kerry L. Wagaman, Waldorf, and Larry D. Henderson, Byrans Road, both of Md., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Jul. 2, 1981, Ser. No. 279,645

Int. Cl.³ C07C *29/60, 77/02*

U.S. Cl. 568—903 5 Claims

1. A method for synthesizing an alkenol from 1,3 butanediol in the liquid phase which comprises:

admixing a trivalent metal sulfate selected from the group consisting of aluminum sulfate, chromium sulfate, ferric sulfate, and mixtures thereof, as a catalyst, with 1,3-butanediol, in an effective amount, thereby forming a mixture of said catalyst suspended in 1,3-butanediol;

heating said mixture to a temperature from about 70° C. below to about 100° C. above the boiling point of 1,3-butanediol, thereby partially dehydrating 1,3-butanediol to 3-buten-1-ol which flash-evaporates to a vapor; and

condensing said vapor to isolate 3-buten-1-ol.

4,400,563

PROCESS FOR PREPARING PERFLUORO(LOWER)ALKYLBENZENES AND THEIR DERIVATIVES

Yohnosuke Ohsaka; Uji Hiramatsu, both of Takatsuki, and Toshihide Honda, Toyonaka, all of Japan, assignors to Daikin Kogyo Co., Ltd., Osaka, Japan

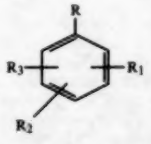
Continuation-in-part of Ser. No. 864,804, Dec. 27, 1977, Pat. No. 4,367,350. This application Jun. 20, 1979, Ser. No. 50,212

Claims priority, application Japan, Dec. 27, 1976, 51-159034

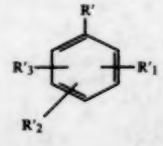
Int. Cl.³ C07C *17/20*

U.S. Cl. 570—144 8 Claims

1. A process for preparing perfluoro(lower)alkylbenzene derivatives which comprises contacting a lower alkylbenzene compound of the formula:



wherein R is lower alkyl and R_1, R_2 and R_3 are each hydrogen, trichloromethyl, nitro, cyano or halogen, but wherein all of R_1, R_2 and R_3 are not hydrogen at the same time and when one of R_1, R_2 and R_3 is nitro, each of the other two is not nitro, with hydrogen fluoride in the presence of chlorine in the absence of a catalyst and in the gaseous phase at an elevated temperature to give the corresponding perfluoro(lower)alkylbenzene compound of the formula:



wherein R' is perfluoro(lower)alkyl and R_1', R_2' and R_3' are each hydrogen, trifluoromethyl, nitro, cyano or halogen, but

all of R_1', R_2' and R_3' are not hydrogen at the same time and when one of R_1', R_2' and R_3' is nitro, each of the other two is not nitro.

4,400,564

SEPARATION OF MONOOLEFINS FROM DIOLEFINS

Marvin M. Johnson, and Donald C. Tabler, both of Bartlesville, Okla., assignors to Phillips Petroleum Company, Bartlesville, Okla.

Filed Apr. 14, 1980, Ser. No. 140,283

The portion of the term of this patent subsequent to Aug. 9, 2000, has been disclaimed.

Int. Cl.³ C07C *7/148*

U.S. Cl. 585—845 **19 Claims**

1. A process for at least partially separating at least one monoolefin from admixture with at least one diolefin comprising the steps of:

contacting the mixture of at least one monoolefin and at least one diolefin with a complexing agent selected from the group consisting of copper(I) salts of sulfonic acids and copper(I) salts of dialkyl phosphates and a suitable hydrocarbon solvent for said complexing agent under such conditions that the at least one monoolefin forms a substantially soluble complex, in said suitable hydrocarbon solvent, with said complexing agent and the at least one diolefin forms a substantially insoluble complex, in said suitable hydrocarbon solvent, with said complexing agent; and

separating said substantially insoluble complex from the solution of said suitable hydrocarbon solvent which contains said substantially soluble complex to thereby effectively separate said at least one monoolefin from said at least one diolefin.

4,400,565

CO-CATALYST FOR USE WITH BORON TRIFLUORIDE IN OLEFIN OLIGOMERIZATION

Jerome W. Darden; Edward T. Marquis, and Lewis W. Watts, Jr., all of Austin, Tex., assignors to Texaco Inc., White Plains, N.Y.

Filed Apr. 28, 1982, Ser. No. 372,494

Int. Cl.³ C07C *1/16, 2/74, 2/02*

U.S. Cl. 585—10 **42 Claims**

21. A method for the production of olefin oligomers comprising

(a) reacting a mixture of alpha olefins and internal olefins, both the alpha and internal olefins having between 9 and 24 carbon atoms, inclusive, in the presence of boron trifluoride and a perfluorosulfonic acid cationic ion exchange resin in an amount of about 2 weight percent of the total olefin mixture at a temperature in the range of 75° to 85° C., the mixture of olefins being comprised of greater than 50 weight percent internal olefins,

(b) hydrogenating the resulting oligomers in the presence of hydrogen and a hydrogenation catalyst, and

(c) separating out any unreacted monomer as the only separation step.

25. A synthetic lubricant component prepared according to the method of claim 21.

4,400,566

REDUCTION OF ORGANIC HALIDES

Ismael Colon, Middlesex, N.J., assignor to Union Carbide Corporation, Danbury, Conn.

Continuation-in-part of Ser. No. 302,691, Sep. 15, 1981, abandoned, which is a continuation of Ser. No. 199,383, Oct. 21, 1980, abandoned. This application Mar. 24, 1982, Ser. No. 361,192

Int. Cl.³ C07B *17/00*; C07C *1/26*

U.S. Cl. 585—359 **22 Claims**

1. Method of reducing organic halides free of nitro substituents which comprises contacting said organic halides in a solvent under an inert atmosphere with a catalytic amount of a catalytic mixture consisting essentially of:

(1) a nickel compound containing no radicals in which N and O are bonded directly to each other; and

(2) a triarylphosphine having 6 to about 24 carbons in each aryl moiety, in the presence of reducing means for maintaining nickel in the zero valence state, at a temperature of up about 250° C., wherein the ratio of triarylphosphine to nickel is at least about 0.1.

4,400,567

OXIDATIVE COUPLING OF AROMATIC METHYL GROUPS

Theodorus M. Wortel, Moerkapelle, and Jan H. Schutten, Hellevoetsluis, both of Netherlands, assignors to Exxon Research & Engineering Co., Florham Park, N.J.

Filed Sep. 20, 1982, Ser. No. 419,751

Claims priority, application United Kingdom, Sep. 23, 1981, 8128748

Int. Cl.³ C07C *3/14, 3/12*

U.S. Cl. 585—428 **10 Claims**

1. A process for the selective dehydrocoupling of an aromatic compound having a methylidyne group (—CH<) attached to the aromatic nucleus to form dimeric products, in which process the aromatic compound is oxidatively coupled in the liquid phase with a peroxodisulphate in the presence of a quaternary ammonium salt in which the quaternary ammonium cation has substituents selected from the group consisting of methyl, ethyl and benzyl substituents, there being at least 0.2 equivalents of said quaternary ammonium cation per mole of said peroxodisulphate.

4,400,568

PROCESS FOR PREPARING STYRENE, AND AN APPROPRIATE AGENT

Hanns Hofmann; Gerd Emig, both of D-8520 Erlangen, and Wolfgang Ruppert, D-6104 Seeheim, all of Fed. Rep. of Germany, assignors to Hanns Hofmann; Gerd Emig, both of Erlangen and Wolfgang Ruppert, Seeheim, all of, Fed. Rep. of Germany

Filed Apr. 16, 1982, Ser. No. 368,920

Int. Cl.³ C07C *5/36*

U.S. Cl. 585—443 **14 Claims**

1. A process for oxidatively dehydrogenating ethylbenzene to prepare styrene, which process comprises reacting ethylbenzene in the vapor phase with oxygen at a temperature above 350° C. in the presence of a crystalline zirconium phosphate catalyst capable of ion exchange, said zirconium phosphate catalysts having been precipitated in a gel-like form from a zirconium salt solution by the addition of an excess of phosphate ions, impregnated with at least 1 liter of an at least 10 M orthosphophoric acid per 100 g of zirconium phosphate gel, filtered off from excess phosphoric acid, washed with water until the water draining off has a pH of 2 to 3 and dried at 120° to 250° C.

4,400,569

METHOD AND APPARATUS FOR DEHYDROGENATION OF ALKYLAROMATIC COMPOUNDS TO PRODUCE VINYLAROMATIC MONOMERS

Thomas M. Hunton, Big Spring, Tex., assignor to Cosden Technology, Inc., Dallas, Tex.

Filed Oct. 27, 1981, Ser. No. 315,428

Int. Cl.³ C07C *5/36, 5/38, 5/40*

U.S. Cl. 585—444 **29 Claims**

1. A method for catalytically dehydrogenating alkylaromatic compounds to produce vinylaromatic monomers comprising:

flash vaporizing an alkylaromatic compound stream;

subsequently introducing the flash vaporized alkylaromatic compound and superheated steam into a dehydrogenation

zone containing a bed of alkylaromatic compound dehydrogenation catalyst at an elevated temperature sufficient to induce catalytic dehydrogenation; and

withdrawing vinylaromatic compound containing effluent gases from said dehydrogenation zone.

4,400,570

ETHYLBENZENE PRODUCTION EMPLOYING TEA-SILICATE CATALYSTS

James R. Butler; Cleve H. Forward, and Thomas W. Robison, all of Big Spring, Tex., assignors to Cosden Technology, Inc., Dallas, Tex.

Filed May 21, 1982, Ser. No. 380,583
Int. Cl.³ C07C 2/68
U.S. Cl. 585—467 10 Claims

1. A process for producing ethylbenzene comprising contacting benzene and ethylene under alkylation conditions which include an effective amount of steam, in the presence of a TEA-silicate catalyst material, the presence of said steam effecting increased catalytic conversion to ethylbenzene.

4,400,571

HYDROCARBON ISOMERIZATION PROCESS

Delmar W. Robinson, Palatine, Ill., assignor to UOP Inc., Des Plaines, Ill.

Division of Ser. No. 257,690, Apr. 27, 1981, Pat. No. 4,362,653. This application Sep. 10, 1982, Ser. No. 417,255
Int. Cl.³ C10G 35/06, 47/04
U.S. Cl. 585—480 5 Claims

1. A process for the catalytic isomerization of a hydrocarbon which comprises contacting the hydrocarbon at hydrocarbon isomerization conditions with a catalytic composite comprising from about 5 weight percent to about 95 weight percent of a silica polymorph consisting of crystalline silica, said silica polymorph after calcination in air at 600° C. for one hour, having a mean refractive index of 1.39±0.01 and a specific gravity at 25° C. of 1.70±0.05 g/cc and at least 5 weight percent to about 95 weight percent Ziegler alumina.

4,400,572

HYDROCARBON CONVERSION

Ivan J. S. Lake, Middlesbrough, and Thomas V. Whittam, Darlington, both of England, assignors to Imperial Chemical Industries PLC, London, England

Filed Nov. 30, 1981, Ser. No. 326,027
Claims priority, application United Kingdom, Dec. 11, 1980, 8039686
Int. Cl.³ C07C 5/22
U.S. Cl. 585—481 10 Claims

1. A hydrocarbon conversion process which comprises contacting a feed of an alkylbenzene or a mixture of alkylbenzenes under isomerisation conditions in the vapour or liquid phase with a catalyst comprising zeolite Nu6-(2).

4,400,573

MODIFICATION OF HYDROCARBON CONVERSION PROCESSES OVER CRYSTALLINE BOROSILICATE CATALYSTS BY ADDITION OF AN ALCOHOL OR ETHER

Raymond C. Feld, Winfield, and Allen I. Feinstein, Wheaton, both of Ill., assignors to Standard Oil Company (Indiana), Chicago, Ill.

Continuation-in-part of Ser. No. 281,889, Jul. 9, 1981, abandoned. This application Aug. 2, 1982, Ser. No. 404,315
Int. Cl.³ C07C 5/22
U.S. Cl. 585—481 14 Claims

1. In a process to convert alkyl-substituted aromatic hydrocarbons by contact of an alkyl-substituted aromatic hydrocarbon feed with an AMS-1B crystalline borosilicate-based catalyst incorporated within a matrix material and on which is impregnated a molybdenum compound, the improvement comprising incorporating above about 50 ppm alcohol or ether into the alkyl-substituted aromatic hydrocarbon feed.

4,400,574

ISOMERIZATION CATALYST AND PROCESS FOR PRODUCTION THEREOF

Tokuo Fujiso, Yokosuka; Soichi Nomura, Tokyo, and Tadashi Ohmori, Yokohama, all of Japan, assignors to Nippon Oil Company, Ltd., Japan

Division of Ser. No. 177,510, Aug. 12, 1980, abandoned. This application Oct. 6, 1981, Ser. No. 309,495
Claims priority, application Japan, Aug. 15, 1979, 54-103199
Int. Cl.³ C07C 5/24
U.S. Cl. 585—671 8 Claims

1. A method for converting a linear aliphatic olefin into a branched-chain aliphatic olefin, which comprises contacting at a temperature of 350° to 550° C. said linear aliphatic olefin with a catalyst composition consisting essentially of an active alumina carrier with fluorine and chlorine supported thereon, the amounts of fluorine and chlorine supported being 0.2 to 2.0% by weight, and 0.2 to 4.0% by weight, respectively, based on the total weight of the catalyst composition.

4,400,575

METHANATION OF GAS STREAMS CONTAINING CARBON MONOXIDE AND HYDROGEN

Albert C. Frost, Congers, N.Y., assignor to Union Carbide Corporation, Danbury, Conn.

Filed Jan. 12, 1981, Ser. No. 224,440
The portion of the term of this patent subsequent to Dec. 30, 1997, has been disclaimed.
Int. Cl.³ C10K 3/04
U.S. Cl. 585—733 14 Claims

1. A cyclic process for the production of methane from carbon monoxide-containing gas streams comprising:

(a) passing a carbon monoxide-containing gas stream having a hydrogen concentration of at least about 50% by volume, based on the volume of CO present in said stream, through a hydrogen separation unit to separate said hydrogen in a recoverable form from said gas stream;

(b) passing the thus-preheated carbon monoxide-containing gas stream over a catalyst present in a metal state and capable of catalyzing the disproportionation of carbon monoxide at a pressure of from about 1 to about 100 atmos and a temperature of from about 100° C. to about 350° C., said carbon monoxide thereby being decomposed to form carbon dioxide and an active surface carbon that is deposited on said catalyst, said gas stream being passed over the catalyst for a time sufficient to deposit a surface layer of said active surface carbon on the catalyst essentially without the subsequent formation of inactive coke thereon;

(c) contacting said layer of active surface carbon deposited on the catalyst with said hydrogen removed from the carbon monoxide-containing gas stream of step (b) above at a pressure of from about 1 to about 100 atmos and a temperature of from about 100° C. to about 400° C. for a period of time sufficient to convert said active surface carbon to methane; and

(d) passing additional carbon monoxide-continuing gas through said pretreatment hydrogen separation zone, and over said catalyst from step (c) and repeating steps (b) and (c) on a cyclic basis,

whereby relatively pure methane can conveniently be produced from carbon monoxide-consuming gas streams containing appreciable quantities of hydrogen on a cyclic basis, the use of said hydrogen removed from the feed gas for the conversion of the active surface carbon to methane enhancing the utilization of the CO content of said feed and the overall process for the production of relatively pure, low-cost methane therefrom.

4,400,576

CATALYST PREPARATION

Gerrit J. den Otter, Amsterdam, Netherlands, assignor to Shell Oil Company, Houston, Tex.

Division of Ser. No. 277,359, Jun. 25, 1981. This application Jul. 16, 1982, Ser. No. 399,039

Claims priority, application Netherlands, Aug. 26, 1980, 8004797

Int. Cl.[3] **C07C** *5/24*

U.S. Cl. 585—739 **11 Claims**

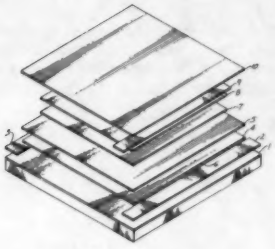
11. The process according to claim 1 wherein said normal paraffins are contacted with said catalyst at a temperature of 150° to 300° C., a pressure of 3 to 50 bar, a space velocity, based on said mordenite, of 0.5 to 10 $Kg \cdot Kg^{-1} \cdot h^{-1}$ and a molar ratio of hydrogen to normal paraffin of 0.5:1 to 10:1.

4,400,577

THIN SOLAR CELLS

Reginald G. Spear, 1434 Park Pl., San Marino, Calif. 91108

Filed Jul. 16, 1981, Ser. No. 284,084
Int. Cl.³ H01L 31/06
U.S. Cl. 136—259 7 Claims



1. A semi-transparent solar cell comprising:
a passivated glass substrate;
a first electrically conductive transparent film on the glass substrate;
a photoactive semiconductor layer over the conductive film having a P-N junction parallel to the glass substrate and sufficiently thin to be substantially transparent;
a second electrically conductive transparent film over the semiconductor layer and electrically isolated from the first conductive film;
an electrically insulating transparent layer over the second conductive film;
a first electrically conductive bus bar on the glass substrate along one edge of the semiconductor layer and connected to the first conductive film; and
a second electrically conductive bus bar on the glass substrate along the opposite edge of the semiconductor layer and connected to the second conductive film.

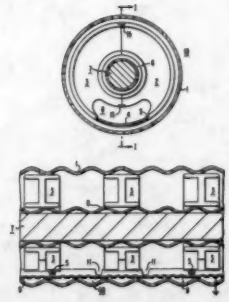
3. A solar cell as recited in claim 1 wherein the insulating layer comprises a layer of glass laminated to the glass substrate.

4,400,578

HIGH VOLTAGE GAS INSULATED TRANSMISSION LINE WITH CONTINUOUS PARTICLE TRAPPING

Alan H. Cookson, Pittsburgh, and Steinar J. Dale, Monroeville, both of Pa., assignors to the United States of America as represented by the U.S. Department of Energy, Washington, D.C.

Filed Mar. 12, 1981, Ser. No. 243,213
Int. Cl.³ H01B 9/06, 9/04; H02G 5/06
U.S. Cl. 174—14 R 20 Claims



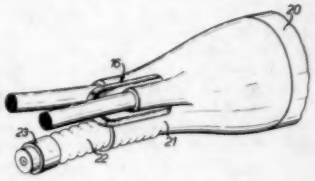
1. A high voltage gas insulated transmission line, comprising:
(a) an elongated corrugated conductive outer housing;
(b) an insulating gas disposed within said elongated corrugated conductive outer housing;
(c) an elongated conductor mounted within said elongated corrugated conductive outer housing;
(d) insulating means disposed within said elongated corrugated conductive outer housing for supporting said elongated conductor;
(e) a perforated elongated metallic strip disposed within said elongated corrugated conductive outer housing continuous throughout the length of the transmission line, said perforated elongated metallic strip having a plurality of cutouts in its edges for flexibility and being supported by said insulating means in close proximity to said elongated corrugated conductive outer housing; and
(f) grounding means for making a solid electrical connection between said perforated elongated metallic strip and said elongated corrugated conductive outer housing whereby said perforated elongated metallic strip in combination with low concavity regions interiorly of said elongated corrugated conductive outer housing create low electric field regions to trap particles.

4,400,579

BRANCH-OFF ASSEMBLY

Jean-Marie E. Nolf, Hamme-Mille, Belgium, assignor to N.V. Raychem S.A., Kessel-lo, Belgium

Division of Ser. No. 973,614, Dec. 27, 1978, Pat. No. 4,298,415.
This application Jun. 21, 1980, Ser. No. 162,406
Int. Cl.³ H01R 13/46
U.S. Cl. 174—854 R 81 Claims



3. An assembly comprising a heat-shrinkable sleeve capable of being positioned around at least first and second elongate substrates, and a clip formed as a trident, the outer legs of which are capable of being positioned over the outer surface of the sleeve at the end thereof, with the central leg of the trident inside the sleeve, so as to form, and maintain during subsequent heat-shrinkage of the sleeve, at least two terminal conduits respectively capable of receiving the first and second substrates.

4,400,580

PROCESS FOR PRODUCING CROSSLINKED POLYETHYLENE INSULATED CABLE

Shosuke Yamanouchi, and Kelichi Kojima, both of Osaka, Japan, assignors to Sumitomo Electric Industries, Ltd., Osaka, Japan

Continuation of Ser. No. 99,810, Dec. 3, 1979, abandoned. This application May 3, 1982, Ser. No. 374,136
Claims priority, application Japan, Dec. 1, 1978, 53-149212
Int. Cl.³ H01B 13/14, 1/00, 5/16
U.S. Cl. 174—102 SC 8 Claims

1. A process for producing a crosslinked polyethylene insulated cable having an outer semiconductive layer which comprises providing an internal semiconductive layer, and an electrically insulating layer on an electrical conductor in conventional manner, coating by extrusion a resin composition comprising 100 parts by weight of an ethylene/vinyl acetate copolymer having a vinyl acetate content of at least about 55%

by weight and about 5 to about 100 parts by weight of carbon black and a crosslinking effective amount of a crosslinking agent on said electrically insulating layer and heating said coated composition to at least about 250° C. in a nitrogen atmosphere to crosslink said resin composition.

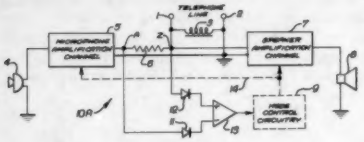
3. A crosslinked polyethylene insulated cable produced by the process of claim 1.

4,400,581

INCOMING AUDIO DETECTION CIRCUIT FOR A SPEAKER TELEPHONE

Sava Jacobson, 8130 Orion St., Van Nuys, Calif.

Filed Nov. 3, 1980, Ser. No. 203,353
Int. Cl.³ H04M *1/60*
U.S. Cl. 179—1 HF **7 Claims**



1. A circuit for use in a speaker telephone of the type having telephone line terminals connectable to a telephone line, a microphone and a microphone amplifier for amplifying speech from the microphone for transmission to the telephone line via said terminals, said circuit being used for detecting the presence of audio incoming from the telephone line while outgoing speech is being amplified by said microphone amplifier and transmitted to the telephone line, said circuit comprising:

an impedance element having one node connected to a telephone line terminal of said speaker telephone at which terminal both the outgoing speech and the incoming audio appear, and having a second node connected to the output of said microphone amplifier, the effective amplitude of outgoing speech being greater at the node of said impedance element which is connected to said microphone amplifier output than at the node of said impedance element which is connected to said telephone line terminal,

first rectifier means for rectifying without filtering the audio present at said impedance element node connected to said telephone line terminal,

second rectifier means for rectifying without filtering the audio present at said impedance element node connected to said microphone amplifier output, and

comparator means for comparing on a cycle by cycle basis the signals from said first and second rectifier means and for producing a comparator output signal only when the rectified but unfiltered signal from said first rectifier means exceeds that from said second rectifier means, this condition being indicative of the presence of incoming audio, the operational mode of said speaker telephone being switched from outgoing speech transmission to incoming audio reception in response to said produced output signal.

4,400,582

SPEECH SYNTHESIZER

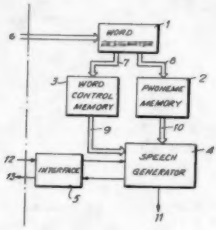
Koji Takeda; Masao Akahane, and Chitoshi Takayama, all of Suwa, Japan, assignors to Kabushiki, Kaisha Suwa Seikosha, Tokyo, Japan

Filed May 27, 1981, Ser. No. 267,280
Claims priority, application Japan, May 27, 1980, 55-70613; May 29, 1980, 55-72025; May 29, 1980, 55-72026; Sep. 25, 1980, 55-133298; Oct. 14, 1980, 55-143157
Int. Cl.³ G10L *1/00*
U.S. Cl. 179—1 SM **20 Claims**

1. A speech synethesizer for producing speech by connecting phonemes together, comprising:

phoneme memory means, said phoneme memory means containing an ordered arrangement of data storage regions of equal and fixed capacity, each said region storing data representative of one of voiced and voiceless phonemes, said data being stored in said ordered arrangement in the sequence of occurrence of said phonemes in natural speech;

word control memory, said word control memory storing groups of control information necessary for synthesizing sound from said stored phoneme data, particular control information being provided to said phoneme memory means to regulate the synthesizing of phoneme data from each said data region, each said group of control information including at least amplitude, pitch and repetition information;



speech generator, said generator receiving phoneme data from said phoneme memory means in a phoneme data sequence controlled by said control memory information and outputting audible signals; and

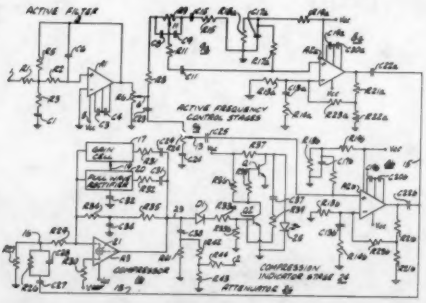
a word designator, said word designator selecting a first region in said phoneme memory means to provide first phoneme data to said speech generator, and selecting a first group of controlled information from said word control memory to regulate said phoneme memory means in the synthesization of a speech signal from said first phoneme data, said first region storing phoneme data of the initial portion of the synthesized audible output.

4,400,583

COMPLETE AUDIO PROCESSING SYSTEM

Graham P. Bloy, Bangkok, Thailand, assignor to Metme Communications, St. Louis, Mo.

Continuation-in-part of Ser. No. 59,394, Jul. 20, 1979, abandoned. This application Jul. 10, 1981, Ser. No. 282,051
Int. Cl.³ H04B *1/64*
U.S. Cl. 179—1 D **15 Claims**



1. A complete audio processing system for providing harmonic modification of any complex, compounded audio waveform of an audio signal, said system comprising an audio input for receiving an original audio signal from an external signal source, means for separating said audio signal into a plurality of

different frequency bands, a plurality of channels, each separately gain-controllable, for receiving the respective frequency bands, gain control means in each channel for controlling the level of signals in the respective channel within each of the respective frequency bands associated with said channels thereby to control the amplitude of fundamental and harmonic audio signals within said bands, means for mixing output signals of said channels to provide a mixed audio signal, signal compressor means for dynamically compressing said mixed audio signal to provide a dynamically compressed tonally controlled audio signal, said signal compressor means providing dynamic compression of an input signal summed therein at a summing node and having a signal gain G_{comp} expressed by the function

$$G_{comp}=(KI_b^{\lambda})/V_{in}$$

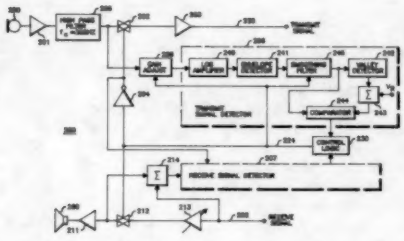
where I_b is the current flowing into said summing node, V_{in} is the average input voltage to said compressor means, and K is a gain constant, and an output for connection of external audio equipment to receive said dynamically compressed, tonally controlled audio output signal.

4,400,584

SPEAKERPHONE FOR RADIO AND, LANDLINE TELEPHONES

Richard J. Vilmur, Bellwood, Ill., assignor to Motorola, Inc., Schaumburg, Ill.

Filed Apr. 5, 1982, Ser. No. 365,811
Int. Cl.³ H04M *1/62, 9/08*
U.S. Cl. 179—1 HF **27 Claims**



1. Circuitry for controlling the application of audio signals from a communication path to utilization means and the application of audio signals from an audio signal source to the communication path, comprising:

first and second detecting means for detecting the presence of audio signals from the communication path and the audio signal source, respectively, and each generating an output signal having a first state when audio signals are present and a second state when audio signals are absent;

first generating means for generating an output signal having a first state when the second detecting means output signal has a first state, and a second state when both the second detecting means output signal has a second state and the first detecting means output signal changes from the second state to the first state;

second generating means for generating an output signal having a first state when the first detecting means output signal has a first state, and a second state when both the first detecting means output signal has a second state and the second detecting means output signal changes from the second state to the first state;

first and second delay means, coupled to the first and second detecting means, respectively, for each generating an output signal having a first state when the corresponding detecting means output signal has a first state, and having a second state a predetermined time interval after the corresponding detecting means output signal has a second state;

control means for generating a control signal having a first state in response to the second state of the second delay means output signal, the second state of the first generating means output signal and the first state of the first detecting means output signal, and a second state in response to the second state of the first delay means output signal, the second state of the second generating means output signal and the first state of the second detecting means output signal;

first switching means responsive to the first state of the control signal for applying audio signals from the communication path to the utilization means; and

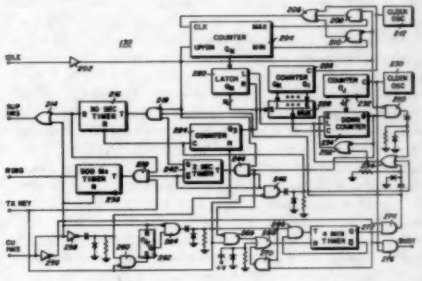
second switching means responsive to the second state of the control signal for applying audio signals from the audio signal source to the communication path.

4,400,585

METHOD AND APPARATUS FOR AUTOMATICALLY ATTEMPTING TO SEIZE A RADIO CHANNEL IN A MULTICHANNEL COMMUNICATION SYSTEM

Richard A. Kaman, Lake Zurich; Kenneth A. Felix, Crystal Lake; Philip J. Smanski, Palatine, and John R. Haug, Mount Prospect, all of Ill., assignors to Motorola, Inc., Schaumburg, Ill.

Continuation of Ser. No. 99,106, Nov. 30, 1979, abandoned. This application Jan. 23, 1981, Ser. No. 227,901
Int. Cl.³ H04M *11/00*
U.S. Cl. 179—2 EB **42 Claims**



1. Control means for a mobile station of a multichannel radio communication system, wherein said mobile station includes means for scanning the radio channels for a non-busy radio channel and providing an indication signal when a non-busy radio channel has been detected and means for attempting to seize a radio channel, said control means including:

(a) means for generating a clock input having successive clock cycle intervals;

(b) counting means responsive to the clock signal for continuously totallizing the clock cycle intervals of the clock signal to provide a totallized count thereof, the counting means being incremented for each clock cycle interval in response to the presence of the indication signal and being decremented for each clock cycle interval in response to the absence of the indication signal;

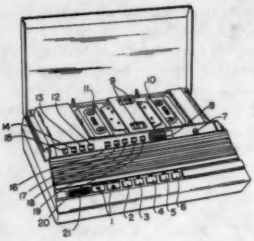
(c) means responsive to an unsuccessful channel seizure attempt by said seizing means for generating a random time interval having a magnitude that is at most a maximum magnitude, where the maximum magnitude is inversely proportional to the totallized count of the counting means; and

(d) means for automatically attempting to seize a radio channel at the end of the random time interval.

4,400,586
REMOTE MESSAGE REPEAT CONTROL FOR TELEPHONE ANSWERING SYSTEM

Bradford E. Hanscom, Downey, Calif., assignor to T.A.D. Avanti, Inc., Compton, Calif.

Filed Sep. 14, 1981, Ser. No. 301,756
Int. Cl.³ H04M *1/64*
U.S. Cl. 179—6.11 **3 Claims**



1. A telephone answering system for responding to telephone messages received over a telephone line comprising: a first magnetic tape mechanism having a recorded announcement thereon which is transmitted over the telephone line during a first time interval (T_1) in response to a ring signal received over the telephone line, and a second magnetic tape mechanism for recording messages received over the telephone line during a second time interval (T_2) following the first interval; audio circuit means adapted to be connected to the telephone line to transmit announcement signals over the telephone line, to receive message signals over the telephone line, to receive a predetermined control signal over the telephone line, and to transmit tone signals over the telephone line; a microcomputer connected to said audio circuit means for generating an output signal upon the receipt of said predetermined control signal; control circuitry connected to said microcomputer and responsive to said output signal for causing said second magnetic tape mechanism to introduce messages recorded thereon successively to said audio circuit means for transmission over the telephone line; tone signal generating circuitry connected to said microcomputer and to said audio circuit means for causing said audio circuit means to transmit distinct tone signals over the telephone line at the end of each of said messages transmitted over the telephone line by said audio circuit means; and further circuitry connected to said audio circuit means and to said control circuitry and responsive to said predetermined control signal received over the telephone line by said audio circuit means within a predetermined time interval after the transmission of said distinctive tone signals over the telephone line at the conclusion of each of said messages to cause said second tape mechanism to rewind an amount equal to the length of the preceding message and then to reintroduce such preceding message to said audio circuit means; and in which said further circuitry causes said control circuitry to cause said second magnetic tape mechanism to introduce the next message to said circuit means in the absence of said predetermined control signal received over said telephone line within said predetermined time interval.

4,400,587
OVERFLOW AND DIVERSION TO A FOREIGN SWITCH

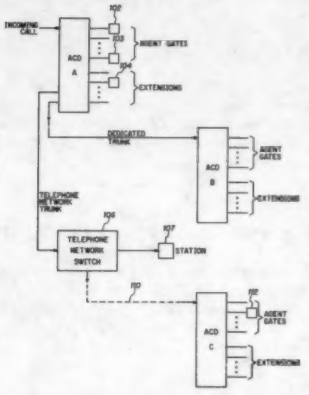
Michael P. Taylor, and Jean R. Oliphant, both of Cedar Rapids, Iowa, assignors to Rockwell International Corporation, El Segundo, Calif.

Filed Aug. 25, 1981, Ser. No. 296,033
Int. Cl.³ H04Q *3/64*
U.S. Cl. 179—27 D **8 Claims**

1. In an automatic call distributor system of the type wherein an incoming call is assigned to an original agent gate, and where in a selected circumstance the call is to be re-routed from the original gate, and wherein said system is connected to a plurality of trunks, which include telephone network trunks and which may in addition include one or more dedicated trunks, the method comprising the steps of:

reading from a computer memory a network number of a destination to be used in the event of re-routing from said original gate;

in response to said reading, determining whether to dial said network number over one of said trunks and, responsive to the results of said determining, optionally automatically electronically performing said dialing, including, if suitable for said destination, over one of said telephone network trunks, said determining including:



ascertaining before said dialing which of the trunks are suitable for connecting the automatic call distributor system to said destination, and

checking said suitable trunks for an idle one available to connect said system to said destination, and

in the event none of said trunks suitable for connecting to said destination are idle, entering an identifier of said call in a queue for access to said original gate, instead of dialing said network number; and

in response to completion of a connection between the destination of said dialed number and said automatic call distributor over said one of said trunks, automatically electronically switching said incoming call to connect to said one of said trunks and thereby to said destination.

4,400,588
ELECTRONIC VOICE NETWORK FOR A TELEPHONE SUBSCRIBER'S SUBSTATION

William Stobbs, North Reading, Mass.; Charles Hines, and Rickey W. Light, both of Huntsville, Ala., assignors to GTE Automatic Electric Labs Inc. and GTE Labs Inc., both of Northlake, Ill.

Filed Jun. 15, 1981, Ser. No. 273,700
Int. Cl.³ H04M *1/00, 1/76*
U.S. Cl. 179—81 R **8 Claims**

1. A voice network for a telephone subscriber's substation, connected to a telephone central office via a loop circuit, said central office operated to generate a bias signal and a first group of voice frequency signals of varying amplitude, said voice network comprising:

loading means connected to said loop circuit operated in response to predetermined levels of said bias signal to shunt corresponding predetermined portions of said bias signal;

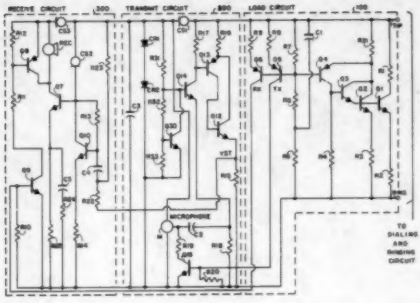
transmit regulation means connected to said loop circuit and operated in response to predetermined levels of said bias

signal to provide a transmit regulation control signal having corresponding predetermined levels of amplitude;

receive regulation means connected to said loop circuit and operated in response to predetermined levels of said bias signal to provide a receive regulation control signal having corresponding predetermined levels of amplitude;

transmitting means connected to said loop circuit and said transmit regulation means and operated to generate a second group of voice frequency signals of varying amplitude;

receiving means connected to said loop circuit and said receive regulation means and operated in response to said first group of voice frequency signals to generate audible signals of varying amplitude; and



current control means operated to provide a constant current power supply for said transmitting and receiving means;

said transmitting means further operated in response to said transmit regulation control signal of predetermined levels of amplitude to attenuate the amplitude of said second group of voice frequency signals by corresponding predetermined amounts;

said receiving means further operated in response to said receive regulation control signal of predetermined levels of amplitude to attenuate the amplitude of said audible signals by corresponding predetermined amounts.

4,400,589

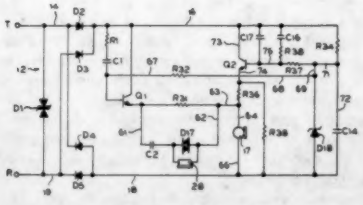
SUBSCRIBER STATION NETWORK

Jan Synek, Chicago, Ill., and Michael Tentler, Kenosha, Wis., assignors to United Networks, Inc., Chicago, Ill. and Manu-Tronics, Inc., Kenosha, Wis.

Continuation-in-part of Ser. No. 78,517, Sep. 24, 1979, abandoned, which is a continuation-in-part of Ser. No. 41,004, May 21, 1979, Pat. No. 4,303,805. This application Jul. 13, 1981, Ser. No. 283,116

Int. Cl.³ H04M *1/58*

U.S. Cl. 179—81 R **7 Claims**



1. An improved subscriber station network for a telephone system including telephone lines for connecting said subscriber station to other telephone subscriber stations,

said telephone system comprising at least two lines having a DC potential therebetween,

telephone receiver means for receiving communications from said lines,

telephone transmitter means for transmitting communication signals over said lines,

the improvement characterized in that a transmitter transistor means is provided in a series circuit with said transmitter means,

said series circuit coupled between said at least two lines,

means connecting said transmitter transistor to said receiver means to control the level of the signal passing through said receiver means,

bridge means for maintaining one of said at least two lines at a positive potential and the other of said at least two lines at a negative potential,

receiver transistor means provided in said receiver means, and

means for connecting said receiver transistor means through said receiver means to said transmitter means where said transmitter means connects said transmitter transistor means to said series circuit.

4,400,590

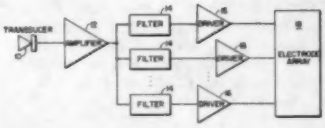
APPARATUS FOR MULTICHANNEL COCHLEAR IMPLANT HEARING AID SYSTEM

Robin P. Michelson, Redwood City, Calif., assignor to The Regents of the University of California, Berkeley, Calif.

Filed Dec. 22, 1980, Ser. No. 219,341

Int. Cl.³ H04R *1/22, 25/00*

U.S. Cl. 179—107 FD **10 Claims**



1. A hearing aid apparatus for electrical excitation of the cochlea of the ear, comprising:

transducer means for converting an external audio signal into an electrical signal;

amplifying means responsive to the electrical signal for producing an amplified signal;

a plurality of filter means responsive to the amplified signal for separating the amplified signal into a plurality of frequency component signals and for selectively shaping the component signals;

driver means responsive to the component signals for amplifying the component signals;

a prealigned array of electrodes responsive to the amplified component signals and positionable within the cochlea of the ear for stimulating nerve endings within the cochlea in predetermined locations.

4,400,591

SIMULATED SPACE HELMET

Daniel E. Jennings, 9601 Glenn Green, Dallas, Tex. 75217, and Richard S. Woodling, 103 Pine St., Keene, Tex. 76059

Filed Jul. 17, 1981, Ser. No. 284,585

Int. Cl.³ H04M *1/05*

U.S. Cl. 179—156 R **1 Claim**

1. A toy space helmet comprising, in combination:

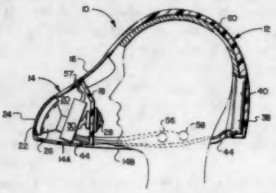
a helmet having a head covering portion, a forwardly projecting nose housing and a viewing shield connected between said head covering portion and said nose housing;

said nose housing having a loudspeaker port opening and having a sidewall baffle portion enclosing a chamber behind said port opening;

a loudspeaker mounted on said nose housing and received within said chamber in alignment with said port opening;

a microphone for producing an audio signal mounted on said baffle externally of said chamber;

a voice alteration unit received within said chamber having an input coupled to said microphone and an output coupled to said loudspeaker, said voice alteration unit including an oscillator for producing a periodic signal, a multiplier having a first input coupled to said microphone for receiving said voice signal, a second input coupled to said oscillator for receiving said periodic signal and having an audio output corresponding to the product of said voice signal and said periodic signal, and an audio amplifier having an input coupled to said multiplier output and having an output coupled to said loudspeaker; and,



a battery pack including one or more batteries lodged in said head covering portion and electrically coupled to said voice alteration unit for providing operating power.

4,400,592

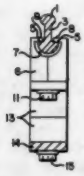
ELECTRIC POWER TRANSMISSION SYSTEM

Donald R. Ross, Sr., Pittsburgh, Pa., assignor to U-S Safety Trolley Corporation, Pittsburgh, Pa.

Filed Aug. 10, 1981, Ser. No. 291,553

Int. Cl.³ B60L *5/08*

U.S. Cl. 191—34 **3 Claims**



1. An electric power transmission system comprising an overhead electrified metal trolley rail having a head and a foot separated by a vertical web integral therewith, the head being adapted to be gripped by hangers for supporting the rail, said foot projecting from opposite sides of the web and having flat upper contact surfaces separated by the web and substantially perpendicular thereto, a trolley shoe slidable along the rail and formed from an elongated block of electrical conducting material extending lengthwise of the rail, the upper portion of the block having a central trough therein extending from end to end of the block and receiving said foot of the rail with the lower portion of the trough spaced from the bottom of the rail, and the upper portion of the trough having integral longitudinal flanges projecting from its opposite sides inwardly toward each other above said foot of the rail, said flanges having flat lower contact surfaces engaging flat against said flat contact surfaces of the rail foot by gravity, the flanges supporting said shoe from the rail, and means secured to the shoe for electrically connecting a power take-off wire thereto.

4,400,593

KEY ARRAY

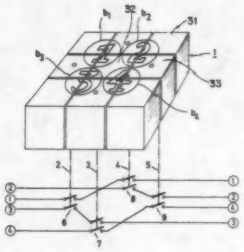
Kurt Kunz, Munich, Fed. Rep. of Germany, assignor to Hans Widmaier Fabrik fur Apparate der Fernmelde-und Feinwerktechnik, Munich, Fed. Rep. of Germany

Continuation-in-part of Ser. No. 917,119, Jun. 19, 1978, abandoned. This application Mar. 10, 1981, Ser. No. 242,385

Claims priority, application Fed. Rep. of Germany, Jun. 28, 1977, 2729157

Int. Cl.³ H01H *13/70*; H02B *15/00*

U.S. Cl. 200—5 A **11 Claims**



1. A keyboard for initiating switching functions, said keyboard comprising:

electrical signal output means;

a plurality of mechanically operated depressable keys arranged in a rectangular array of rows and columns, the exposed top surfaces of said keys lying in a substantially common plane and having visual symbols thereon, each said symbol being allocated only to a group of four keys in a square arrangement of mutually adjacent keys and appearing at the area of mutual adjacency in such manner that each crosspoint of the gaps between keys in the key rows and keys in the key columns is allocated to one symbol and each symbol is allocated to one crosspoint;

individual means for producing a key signal coupled to alternating ones of said keys in each row and in each column in a checkerboard fashion, said key signal resulting from downward motion of each said key, each said group of four keys including two diagonally adjacent keys coupled to respective key signal producing means, at least some of the keys in each group being part of another adjacent group of four keys; and

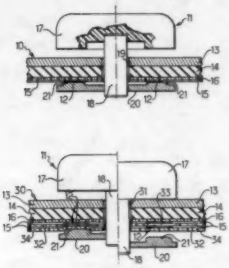
means coupled between said electrical signal output means and said two key signal producing means in each said group for combining said key signals in an AND function to provide an output signal from said electrical signal output means corresponding to said symbol at the crosspoint of gaps of said four keys in a group, said output signal occurring only when the mutually adjacent keys at a crosspoint are depressed, including said two key signal producing means;

whereby depression of less than all of the keys at a crosspoint will not produce an output signal and misoperation of the keys to produce an output signal is highly unlikely.

4,400,594
CONTROL KEYBOARD FOR ELECTRIC OR ELECTRONIC DEVICES

Edouard Serras-Paulet, Casa Nostra Pech des Treilles, Puyloroque, France 82240

PCT No. PCT/FR79/00113, § 371 Date Jul. 22, 1980, § 102(e) Date Jul. 22, 1980, PCT Pub. No. WO80/01218, PCT Pub. Date Jun. 12, 1980
PCT Filed Nov. 28, 1979, Ser. No. 213,999
Claims priority, application France, Nov. 29, 1978, 78 33733
Int. Cl.³ H01H 5/02, 13/00
U.S. Cl. 200—5 A 9 Claims

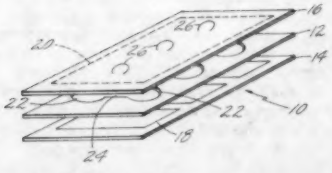


1. A keyboard comprising a layered composite plate made from a layer of magnetic material and an electric printed circuit made on an insulating substrate applied on a lower face of said layer of magnetic material, said plate being formed with holes extending through the layer of magnetic material and the substrate of the electric printed circuit, said keyboard further comprising keys having stems extending through said holes, key tops mounted on the stems and soft iron plates mounted on the stems opposite to said key tops and extending under said composite plate, said soft iron plates being magnetically attracted by said layer of magnetic material and defining a rest position of the keys when applied onto said plate, said soft iron plates further cooperating with conductive contact areas of the electric printed circuit for forming switches which are closed when the keys are in their rest position and opened as soon as the keys leave their rest position.

4,400,595
MEMBRANE SWITCH ASSEMBLY

Jorge S. Ahumada, Mesa, Ariz., assignor to Rogers Corporation, Rogers, Conn.

Filed May 28, 1981, Ser. No. 268,008
Int. Cl.³ H01H 13/04
U.S. Cl. 200—5 A 11 Claims



1. A switch assembly comprising:

first circuit means, said first circuit means comprising a flexible planar non-conductive substrate having a conductive circuit pattern supported on at least a first surface thereof;

second circuit means, said second circuit means including a non-conductive substrate having a conductive circuit pattern supported on at least a first surface thereof, said circuit pattern of said second circuit means facing said circuit pattern of said first circuit means and being at least partly in registration therewith;

non-conductive spacer means, said spacer means being disposed between said first and second circuit means, said spacer means including at least a first aperture extending therethrough, said aperture being aligned with registered circuit portions of said circuit means whereby electrical contact between registered portions of said said circuit pattern of said first circuit means and said circuit pattern of said second circuit means may be established through said spacer means aperture, said aperture cooperating with said circuit means to define a cavity between said first and said second circuit means; and

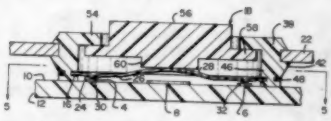
self-regulating vent means, said self-regulating vent means preventing establishment of a pressure differential greater than a preselected level between the interior of said cavity and the ambient environment, said self-regulating vent means being activated by the pressure differential between the interior of said cavity and the ambient environment, said self-regulating vent means comprising:

a non-linear slit, said slit being provided within said first circuit means, said slit forming a flap, said slit being located in the portion of the said first circuit means which defines said cavity.

4,400,596
MEMBRANE SWITCH WITH SEQUENTIALLY CLOSABLE CONTACTS

Kazutoyo Fukukura, Reading, and William J. Lynn, Groveland, both of Mass., assignors to AMP Incorporated, Harrisburg, Pa.

Filed Jan. 15, 1982, Ser. No. 339,558
Int. Cl.³ H01H 13/70
U.S. Cl. 200—5 A 9 Claims



1. A switch of the type having an insulating substrate, a plurality of metallized switch contacts on one surface of the substrate, the switch contacts being adjacent to each other, a flexible sheet extending parallel to, and spaced from the one surface of said substrate, the sheet having an opposed surface which is opposed to the one surface and having a commoning conductor on the opposed surface so that upon flexure of the sheet towards the one surface and engagement of the commoning conductor with the switch contacts, the switch contacts are electrically commoned, the switch being characterized in that:

the one surface of the substrate has first, second, and third switch contacts thereon,

the flexible sheet has first and second contact projections extending from the opposed surface towards the one surface of the substrate, the first contact projection being against, and in electrical contact with, the first switch contact, the second contact projection being spaced from, and in opposed relationship to, the second switch contact,

the flexible sheet has a pair of supporting projections extending from the opposed surface thereof, the supporting projections having apices which are against the one surface of the substrate at locations spaced from the first, second, and third switch contacts, the flexible sheet being an insulating film, the commoning conductor comprising metallization on the opposed surface of the film whereby, upon application of a switch closing force to the flexible sheet at a location opposed to, and in alignment with, the third switch contact, the portion of the commoning conductor on

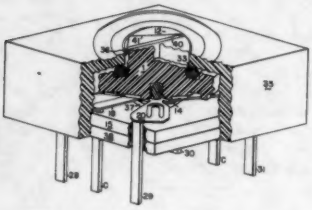
the second contact projection is moved against the second switch contact, and thereafter the portion of the commoning conductor which is opposed to the third switch contact is thereafter moved against the third switch contact.

4,400,597

AXIAL CAM ROTARY SWITCH

Frank J. Bruder, Newport Beach, and Robert D. Taylor, Lakewood, both of Calif., assignors to EECO Incorporated, Santa Ana, Calif.

Filed Feb. 16, 1982, Ser. No. 349,406
Int. Cl.³ H01H *19/60*
U.S. Cl. 200—6 B **8 Claims**



1. A rotary switch, comprising;
(a) a rotor (1), having an axial cam (2) with plural lobes (3–6) at plural radii, and also axial-detent teeth (10) operatively aligned with said lobes,
(b) one stationary electrically-conductive contact spring spider (16), having plural radially outwardly projecting axially-movable cam-follower switch arms (20–23) substantially coplanar with said spider to selectively engage said lobes upon rotation of said rotor,
said one spring spider also having plural integral detent springs (25,26) engaging said axial-detent teeth,
(c) an insulative base (15) having stationary electrically-conductive contacts (28–31) passing through said base in a rectilinear pattern and disposed to be selectively engaged by said switch arms upon axial displacement thereof by said lobes upon rotation of said rotor,
(d) an insulative shaft (12) integral with said rotor,
(e) a resilient "O" ring (33) surrounding said shaft, and
(f) an insulative housing (35) sealed to said base and mechanically bearing upon said "O" ring a substantially constant amount to seal said rotary switch.

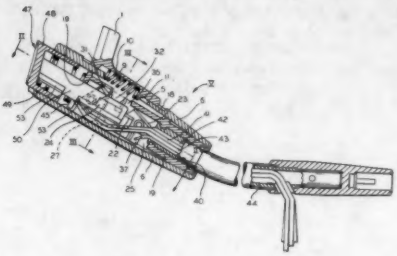
4,400,598

SLIDER SWITCH

Erwin Jandl, and Josef-Elmar Prang, both of Bietigheim-Bissingen, Fed. Rep. of Germany, assignors to ITT Industries, Inc., New York, N.Y.

Continuation of Ser. No. 20,649, Mar. 15, 1979, abandoned. This application Sep. 2, 1980, Ser. No. 183,459
Claims priority, application Fed. Rep. of Germany, Mar. 22, 1978, 2812423
Int. Cl.³ H01H *15/00, 9/00*
U.S. Cl. 200—16 D **3 Claims**

1. A slider switch mechanism especially adapted to mount in a generally cylindrical tubular column such as the steering column of an automotive vehicle, said column having one axial end thereof open, said open end further extending through an inset in the sidewall of the column, said mechanism unitarily insertable into the bore of the tubular column through the open end, said mechanism including an axially elongated suport member bearing a slider member therein, said slider member positioned to rest in the insert so as to be accessible from the exterior of the column, a resilient locking member on said support member mating with a retaining wall of said column during insertion of said assembly into said column to telescopically affix said support member stationarily within said column, said slider member including a manually operable handle protruding from the body thereof through the inset of said column wall, guide means in said column wall on the sides of the inset for constraining said slider member to movement



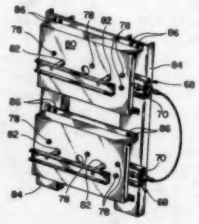
along the body of said support member and said column in a direction parallel to the column axis, a contact operating finger on said slider member movable relative to said support member responsive to slide movement of the slider member.

4,400,599

FLEXIBLE CABLE MECHANICAL INTERLOCK FOR ELECTRIC CONTROL DEVICES

Bernard C. Rickmann, Peru, Ind., assignor to Square D Company, Palatine, Ill.

Filed Oct. 30, 1981, Ser. No. 316,618
Int. Cl.³ H01H *9/26*
U.S. Cl. 200—50 C **11 Claims**



1. An interlock assembly for a first circuit interrupter separated from a second circuit interrupter by a predetermined distance, each circuit interrupter having at least one main set of contacts and a reciprocally movable plunger associated with each main set of contacts, said plungers each operably mounted to reciprocate to an outward position in response to said associated contacts assuming a closed position and to an inward position in response to said associated contacts assuming an open position, said assembly comprising:
first and second lock means respectively associated with the plungers of said first and second circuit interrupters for selectively preventing any of said plungers associated with said first circuit interrupter from simultaneously assuming an outward position with any of said plungers associated with said second circuit interrupter,
said first and second lock means each including a frame member (14);
a plunger bar unit (22, 30) associated for reciprocal movement with respect to said frame member between an outward and an inward position; biasing means (32) for biasing said plunger unit toward said outward position,
a stop link (50) having one end pivotally connected to said plunger unit and having an opposite pivotable end;
a guide rod (54) connected to said opposite end of said stop link;

a guideway (56) formed in said frame member receiving said guide rod;

said guideway having a main portion and an offset portion; said guide rod movable along said main portion of said guideway in response to movement of said plunger unit from said outward position to said inward position,

a flexible push/pull cable having dependent reciprocally movable ends respectively connected to said guide rods, said cable movable from a first position wherein said guide rod of said first lock means is situated in said main portion of said guideway and said guide rod of said second lock means is situated in said offset portion of said guideway to a second position wherein said guide rod of said first lock means is situated in said offset portion of said guideway and said guide rod of said second lock means is situated in said main portion of said guideway, whereby said plunger unit of said first and second lock means are prevented from simultaneously assuming an inward position.

4,400,600

GAS SPRING ARRANGEMENT OPERATING AS AN ELECTRICAL CONNECTION

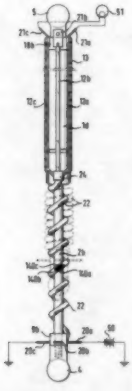
Herbert Freitag, Koblenz-Metternich, and Klaus Schnitzius, Rheinbrohl, both of Fed. Rep. of Germany, assignors to Stabilus GmbH, Koblenz-Neuendorf, Fed. Rep. of Germany

Division of Ser. No. 952,092, Oct. 17, 1978, Pat. No. 4,316,098. This application Oct. 23, 1980, Ser. No. 200,059

Claims priority, application Fed. Rep. of Germany, Oct. 28, 1977, 2748376

Int. Cl.³ H01H *3/16*

U.S. Cl. 200—52 R **16 Claims**



1. A gas spring arrangement comprising:

(a) a cylinder member having an axis and being formed with a cavity, said cylinder member including an annular end wall transverse to said axis;

(b) a body of gas under superatmospheric pressure in said cavity;

(c) a piston rod member axially movable inward and outward of said cavity in sealing engagement with said end wall between two terminal positions;

(d) fastening means on respective axially terminal portions of said cylinder and piston rod members outside said cavity for fastening said members to respective objects;

(e) a first, electrically conductive terminal on said cylinder member outside said cavity;

(f) a second, electrically conductive terminal on said piston rod member outside said cavity;

(g) conductive means connecting said first and second electrically conductive terminals during at least a portion of the movement of said piston rod member between said two terminal positions, said conductive means extending substantially the entire length of said cylinder and piston rod members and including a portion of an elongated, flexible conductor which is axially deformed during said movement of the piston rod member; and

(h) insulating means electrically insulating said conductive means from said cylinder and piston rod members.

4,400,601

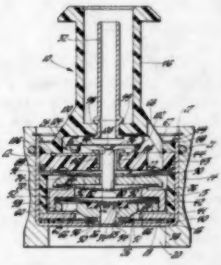
COMBINATION SWITCH AND VALVE DEVICE

Byron L. Brucken, Miamisburg, Ohio, assignor to General Motors Corporation, Detroit, Mich.

Filed Sep. 1, 1981, Ser. No. 298,279

Int. Cl.³ H01H *35/34*

U.S. Cl. 200—81.4 **4 Claims**



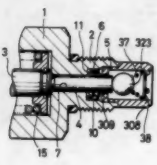
1. A combination high pressure switch-low pressure switch and high pressure relief valve control device comprising: an electrically conductive housing adapted to be electrically grounded on mounting in a pressure control installation, low pressure switch means and high pressure switch means mounted in said housing and operatively electrically connected in series thereof for adaptation in a control circuit, said low pressure switch means including biasing means for urging opening thereof, force transmitting means mounted in said housing having pressure sensing means adapted to be exposed to a pressure to be sensed for normally holding said low pressure switch means closed and responding to pressures below a predetermined low pressure value to effect opening of said low pressure switch means by its biasing means, said high pressure switch means including biasing means for urging closure thereof, said force transmitting means being further responsive to pressure on said pressure sensing means above a predetermined least extreme high pressure value to open said high pressure switch means against its biasing means whereby said high and low pressure switch means cooperatively provide an electrically conductive path to said housing only between said predetermined low pressure value and least extreme high pressure value, and high pressure relief valve means mounted in said housing having biasing means for urging closure thereof, said high pressure relief valve means further having pressure sensing means adapted to be exposed to the pressure to be sensed for responding to pressures above a predetermined most high pressure value substantially higher than least extreme pressure value to open said high pressure relief valve means to provide extreme high pressure relief.

4,400,602

FLUID PRESSURE OPERATED ELECTRICAL SWITCH

Hiromu Kuromitsu, Chiryu, and Yoshiharu Adachi, Gamagori, both of Japan, assignors to Aisin Seiki Kabushiki Kaisha, Aichi, Japan

Filed Apr. 3, 1981, Ser. No. 250,550
Claims priority, application Japan, Apr. 16, 1980, 55-50764; Apr. 23, 1980, 55-53774
Int. Cl.³ H01H 35/38
U.S. Cl. 200—82 C 5 Claims



1. A fluid pressure operated switch comprising:
a hollow body;
an electrical switch member operatively associated with the body;
a plunger slidingly mounted in the body;
switch engaging means carried by the switch member for operative engagement with the plunger at a front end portion of the plunger;
a piston element slidingly mounted in the body in alignment with and engaging a rear end portion of the plunger;
a compressed coil spring operatively associated with said rear end portion of the plunger for normally biasing the plunger toward abutting engagement with the front end portion of the piston element;
sealing means mounted on the piston element for sealing the piston element within the body, said body having a port formed therein for admitting fluid under pressure and to which the piston element is exposed at an acting rear end face portion thereof;
means for limiting motion of the piston element adjacent said rear end face portion of the piston element; and
adjusting means in screw threaded engagement with the body for movably anchoring the coil spring at an end portion thereof adjacent said front end portion of the plunger wherein said means for limiting motion of the piston element further comprises a cage mounted in the port and having an internally extending annular seat disposed around the piston element, a ball movably housed in the cage, and a spring member for urging said ball toward engagement with said annular seat and toward abutment against the rear end portion of the piston element.

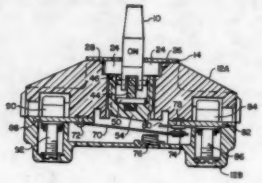
4,400,603

ELECTRICAL SWITCH FOR ALTERNATING CURRENT

Roy O. Wiley, Huntington, Conn., assignor to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Jul. 23, 1981, Ser. No. 286,150
Int. Cl.³ H01H 9/34, 21/84
U.S. Cl. 200—153 G 8 Claims

1. An electric switch comprising:
a stationary contact;
means for connecting said stationary contact to a conductor;
a contact lever, carrying at one end a contact movable into and out of engagement with said stationary contact;
means for connecting said contact lever to a conductor;
a fixed fulcrum to which the opposite end of said contact lever is attached;
a rectilinearly movable brush lifter with a U-shaped slot in the center of the brush lifter;
a brush lifter spring located at each of the ends of said brush lifter, which place a force on said brush lifter in a direction away from said contact lever;
a pivotally mounted operating handle with a U-shaped slot in one end which is off center with respect to the center line of the handle;
a link with an aperture near each end;
two pins, each passing through one of said link apertures where one of said pins is located in said brush lifter U-shaped slot and the second pin is located in said operating handle U-shaped slot;



said operating handle U-shaped slot being closer to said contact lever when said operating handle is in the OFF position rather than in the ON position, to force said brush lifter into said contact lever so that said movable contact separates from said stationary contact; and
a contact spring engaging said contact lever between the ends and on the opposite side as said brush lifter, which exerts a force on said contact lever holding said stationary contact and said movable contact in engagement.

4,400,604

HEAT TREATING METHOD AND APPARATUS USING MICROWAVE

Katsuyuki Ohtsuka, Mito; Hiroaki Miyo, and Daisaku Hayashi, both of Katsuta, all of Japan, assignors to Doryokuro Kakunenryo Kaihatsu Jigyodan, Tokyo, Japan

Filed Mar. 2, 1981, Ser. No. 239,479
Claims priority, application Japan, Mar. 12, 1980, 55-31341
Int. Cl.³ H05B 6/78
U.S. Cl. 219—10.55 M 14 Claims

1. A heat treating method employing microwave which comprises:
placing a plurality of spherical bodies mainly made of a material transparent to microwave in a vessel made of a material reflective to microwave;
feeding a substance to be treated in a liquid form into the vessel and into contact with the spherical bodies;
applying microwave to said substance in the vessel while imparting movement to the spherical bodies, whereby the substance to be treated is attached onto the surfaces of the spherical bodies and is heat-treated; and
separating the thus heat-treated substance from the spherical bodies and pulverizing the substance due to the friction and collision between the adjacent moving spherical bodies.

5. A heat treating apparatus using microwave comprising:
a closed vessel made of a material reflective to microwave;

a grid partitioning the space in said vessel;

a plurality of spherical bodies mainly made of a material transparent to microwave and positioned on the side of said grid toward a microwave guide;

means for imparting movement to said spherical bodies;

means for supplying a substance to be treated in a liquid form onto said spherical bodies;

means for guiding microwave to the substance to be treated while attached onto the surfaces of said spherical bodies; and

means for discharging the heat-treated substance which has been transferred through said grid to the other side of said grid.

4,400,605

METHOD OF PRODUCING WELDED THIN-WALL STRAIGHT-SEAMED TUBES

Jury F. Shevakin; Fikrat Seidaliev; Vladimir M. Tjushevsky; Jury V. Krasovsky; Erika D. Glebova, and Valery K. Chivikin, all of Moscow, U.S.S.R., assignors to Gosudarstvenny Nauchnoissledovatelsky and Proektny I Konstruktorsky Institut Splavov I Obrabotki Tsvetnyky Metallov "Giprotsvetmetobrabotka", both of, U.S.S.R.

Filed Nov. 6, 1981, Ser. No. 318,971

Int. Cl.³ B23K *9/02, 31/06*

U.S. Cl. 219—61 **3 Claims**

1. A method of producing welded thin-wall straight-seamed tubes, comprising forming a strip in the rolls of a tube-forming mill into a tube skelp with a gap between edges being 1/500 to 1/30 of the tube-diameter-to-wall-thickness ratio, taken in mm; subjecting the said tube skelp to the inert-gas-shielded nonconsumable electrode welding; the rate of welding and the welding amperage being selected such as to ensure the release of heat in the welding zone in an amount sufficient to enable the gap between the edges to be closed due to the heat expansion and the formation of a joint weld.

4,400,606

METHOD AND APPARATUS FOR DISCHARGE MACHINING POLYGONAL CONTOURS

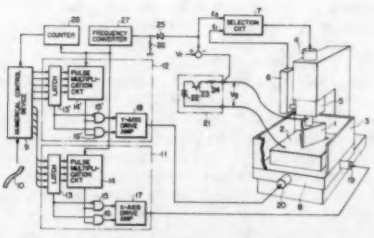
Testuro Itoh; Toshiro Oizumi, and Shigeo Yamada, all of Nagoya, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Oct. 7, 1980, Ser. No. 194,745

Claims priority, application Japan, Oct. 11, 1979, 54/131026; Jan. 30, 1980, 55/9723; Jan. 30, 1980, 55/9724; Jan. 30, 1980, 55/9725

Int. Cl.³ B23P *1/12*

U.S. Cl. 219—69 M **16 Claims**



1. A discharge machining method for machining a workpiece by applying electric current to said workpiece and an electrode having a polygonal contour through a machining solution in the interelectrode space between said workpiece and said electrode comprising the steps of:

displacing said electrode and said workpiece relative to each other in a plane with the direction of movement of said electrode and said workpiece in said plane being substantially perpendicular to a primary machining direction, relative displacement of said workpiece and said electrode being such that a geometric center of said electrode moves along straight lines extending through a geometric center of an area to be machined and intersections of straight lines defining boundaries of said area to be machined such that, during movement along each said straight line extending through said geometric center of said area to be machined and one of said intersections, the two straight lines on said workpiece which form said one of said intersections are maintained parallel to respective two corresponding sides of said electrode, and gap widths between each of said two straight lines on said workpiece and said respective corresponding sides of said electrode are substantially the same throughout said movement; and

performing discharge machining by controlling said electrode and said workpiece in such a manner that an interelectrode space is maintained between said electrode and said workpiece to an extent that electric discharge occurs in said interelectrode space.

4,400,607

EXCHANGING APPARATUS FOR WELDING JIG UNITS OF AN AUTOMATIC WELDING APPARATUS

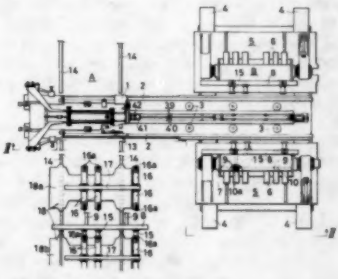
Susumu Wakou, and Satoshi Kadowaki, both of Sayama, Japan, assignors to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed May 29, 1981, Ser. No. 268,571

Claims priority, application Japan, May 30, 1980, 55-73816; Jun. 19, 1980, 55-82156[U]

Int. Cl.³ B23K *9/28*

U.S. Cl. 219—86.8 **2 Claims**

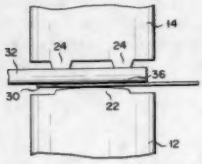


1. An exchanging apparatus for a welding jig unit in combination with an automatic welding apparatus which includes a combining station for combining a work conveyed to this station by a set carrier, at least one automatic welding apparatus for welding the work at the combining station, the automatic welding apparatus having a welding jig unit which is detachable therefrom for exchanging, and a conveying railway for the set carrier, the exchanging apparatus comprising an exchanging railway which crosses the conveying railway through a switch means, and at least two exchanging carriers on the exchanging railway, each having thereon a gripping means for gripping a welding jig unit.

4,400,608
WELDING ELECTRODE PAIR AND METHOD OF WELDING

Yuuji Wagatsuma, Yokosuka, and Hideaki Naruo, Yokohama, both of Japan, assignors to Tokyo Shibaura Denki Kabushiki Kaisha, Kawasaki, Japan

Continuation of Ser. No. 142,658, Apr. 22, 1980, abandoned.
This application Nov. 13, 1981, Ser. No. 321,105
Claims priority, application Japan, Apr. 27, 1979, 54-52311
Int. Cl.³ B23K *11/30, 11/32*
U.S. Cl. 219—107 7 Claims



1. In a process for welding a plate to an elongated rod along the length of said rod wherein the plate and rod are placed and held in contacting relationship between cooperating, substantially parallel end faces of first and second electrodes which are energized in an amount and for a time sufficient to effect welding of said rod and plate, said first and second electrodes having axes normal to the planes of said end faces and aligned with each other and being movable in the direction of the common axis, the improvement comprising the steps of:

(a) forming said first electrode with a single contact portion projecting from and having a length extending across the end face thereof for contact with said plate, the top surface of said single contact portion being gently curved across its width toward said end face; and

(b) forming said second electrode with two spaced contact portions projecting from and each having a length extending across the end face thereof, said two contact portions being substantially parallel to said single contact portion and said single contact portion being aligned with the space between said two contact portions, said two contact portions contacting said rod in substantially perpendicular relationship and cooperating with said single contact portion to hold said plate and rod in contacting relationship during welding.

5. In a welding electrode pair for welding a rod material to a plate material along the length of said rod material, wherein said rod material and plate material are held in contacting relationship between cooperating, substantially parallel end faces of first and second welding electrodes, said electrodes having axes aligned with each other and being movable in a direction of the common axis, the improvement comprising:

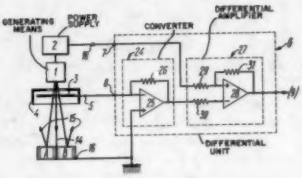
(a) a single contact portion projecting from and having a length extending completely across the end face of said first welding electrode for supporting said plate material, the top surface of said single contact portion being gradually curved across its width toward the end face; and

(b) two spaced contact portions projecting from and each having a length extending completely across the end face of said second welding electrode, said two contact portions being substantially parallel to said single contact portion and said single contact portion being aligned with the space between said two contact portions for holding said rod material between said two contact portions and said plate material, said rod material being disposed substantially normal to said two contact portions.

4,400,609
DEVICE FOR DETECTING SEAM BETWEEN ABUTTING WORKPIECES BY ELECTRON BEAM

Jury I. Pastushenko, ulitsa Granichnaya, 12a, kv. 1; Gleb A. Spynu, Prospekt Nauki, 141/2, korpus 12, kv. 12; Oleg K. Nazarenko, ulitsa Sapernoe pole, 28, kv. 27; Viktor E. Lokshin, pereulok Zhukovskogo, 5, kv. 26, and Vladimir I. Shapoval, ulitsa Sholom Aleikhem, 15B, kv. 83, all of Kiev, U.S.S.R.

Filed Sep. 18, 1980, Ser. No. 188,312
Int. Cl.³ B23K *15/00*
U.S. Cl. 219—121 EV 5 Claims



1. A device for detecting a seam between abutting workpieces by a scanning electron beam, comprising:

a scanning electron beam generating means;

a power supply source connected to said scanning electron beam generating means;

at least one secondary emission detector collecting secondary electrons, having a tap, and positioned during welding between said scanning electron beam generating means and the workpiece being welded;

at least one shield in which a respective detector is disposed;

an information signal generator shaping signals indicative of variation in the surface of the workpiece being welded, and including a differential unit having first and second inputs and an output, said first input of said differential unit being connected to said tap of said detector, said second input of said differential unit being electrically connected to said power supply source, and said output of said differential unit being the output of the device and transmitting information signals indicative of variation in the workpiece surface and corresponding to a difference between a signal representative of pulsation of said electron beam and a signal indicative of a secondary electron flow produced in a zone of electron impingement on the workpiece surface and received by said detector.

4,400,610
AUTOMATIC FILLET WELD TRACING MECHANISM

Masahiro Murakami, and Kazuo Aotsuka, both of Amagasaki, Japan, assignors to Sumitomo Precision Products Company Limited, Amagasaki, Japan

Filed Jun. 22, 1981, Ser. No. 275,612
Claims priority, application Japan, Jul. 10, 1980, 55-94587
Int. Cl.³ B23K *9/12*
U.S. Cl. 219—124.02 4 Claims

1. An automatic fillet weld tracing mechanism for two materials to be welded which are arranged stepwise and parallel to each other, said mechanism comprising:

first motor drive means having a fixed height and adapted to reciprocate a first driven means;

a first sensor means fixed to said first driven means and positioned adjacent a first of said materials to be welded with a predetermined gap therebetween;

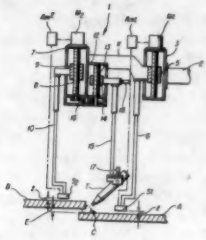
first control means responsive to said first sensor means and adapted to control the actuation of said first motor drive means;

second motor drive means fixed to said first driven means and adapted to reciprocate a second driven means;

a second sensor means fixed to said second driven means and positioned adjacent a second of said materials to be welded with a predetermined gap therebetween;

second control means responsive to said second sensor means and adapted to control the actuation of said second motor drive means;

a third drive means, including means for actuating said third drive means at a predetermined ratio relative to the actuation of said second drive means, said third drive means being adapted to reciprocate a third driven means; and



a torch fixed to said third driven means and positioned to weld at a predetermined point of a gap between said first and second materials to be welded,

whereby a variation of said gap will cause said sensor means and control means to reciprocate said driven means such that said torch remains positioned to weld at said predetermined point.

4,400,611

WELDING AT PRESSURES GREATER THAN ATMOSPHERIC PRESSURE

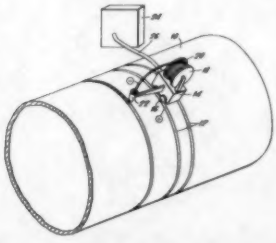
Michael E. Wilkinson, Linton, England, assignor to The Welding Institute, England

Continuation of Ser. No. 939,277, Sep. 5, 1978, abandoned. This application Nov. 14, 1980, Ser. No. 206,861

Claims priority, application United Kingdom, Jul. 4, 1978, 28709/78

Int. Cl.³ B23K *9/16*

U.S. Cl. 219—137 R **5 Claims**



1. A welding method comprising connecting a solid uncoated consumable electrode wire, having a diameter not greater than 1.4 mm, and workpiece to opposite poles of an electrical power supply having a slope, as seen from the welding arc, of between (6–15) V/100 A to form an arc between the electrode and the workpiece and thereby to transfer metal from the electrode to the workpiece, providing an inert gas shield around the arc at the workpiece, and advancing the electrode towards the workpiece at a rate which matches the consumption of the electrode; and further comprising carrying out the welding method at a pressure of at least 7 bars and connecting the power supply so that the electrode is negative with respect to the workpiece.

4,400,612

OVEN FOR SKIN PACKAGING MACHINE

Cleve L. Lee, Anderson, S.C., assignor to Nordson Corporation, Amherst, Ohio

Filed May 6, 1981, Ser. No. 261,003

Int. Cl.³ F27D *11/00*

U.S. Cl. 219—405 **1 Claim**

1. An oven for heating film in a skin packaging machine comprising:

a rectangular-shaped housing having an exterior surface and a downwardly facing, open interior;

a plurality of inverted channel-shaped reflectors each including a flat base mounted to said housing and downwardly and outwardly flaring wings projecting from said base, said reflectors being mounted in said interior of said housing in parallel, spaced relation;

at least two electrical connectors mounted on said flat base of each said reflector;

a plurality of elongated heating elements, each of said reflectors receiving at least one of said heating elements mounted to said electrical connectors;

thermal insulative material surrounding said exterior surface of said housing; and

control means for supplying high energy to said heating elements for a portion of the cycle of operations during which film is heated, and for supplying low energy to said heating elements for the remaining portion of the cycle of operations of the skin packaging machine.

4,400,613

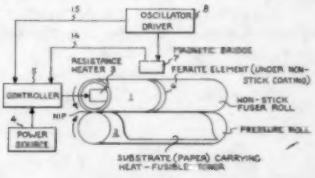
TEMPERATURE CONTROLLER FOR A FUSING ROLLER

John A. Popelish, Waynesboro, Va., assignor to General Electric Company, Waynesboro, Va.

Continuation of Ser. No. 965,880, Dec. 4, 1978, abandoned. This application Aug. 1, 1980, Ser. No. 174,475

Int. Cl.³ A05B *1/02*

U.S. Cl. 219—497 **8 Claims**



1. An arrangement for controlling electrical current supplied from an AC source to a fusing roller in accordance with variable analog control signals representing the variations in temperature of the roller over a given range comprising means for digitizing said analog control signals to provide first control signals, means for controlling the proportion of integral cycles of alternating current from said source blocked to those supplied to said roller during a predetermined control period in which a substantial proportion of integral cycles of alternating current occur in accordance with said first control signals, means to provide a uniform spacing in time of the integral cycles supplied to said roller for all such proportions over said control period, means for indicating the average current consumed by said roller, means responsive to said indicated average current exceeding a predetermined level for providing

second control signals, and means for modifying said first control signals in accordance with said second control signals.

4,400,614

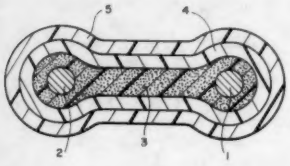
PTC DEVICES AND THEIR PREPARATION

Umesh K. Sopory, San Jose, Calif., assignor to Raychem Corporation, Menlo Park, Calif.

Division of Ser. No. 150,910, May 19, 1980, Pat. No. 4,334,351. This application Nov. 18, 1981, Ser. No. 322,647

Int. Cl.³ H05B 3/34

U.S. Cl. 219—528 **14 Claims**



1. A flexible electrical device which comprises

(a) an elongate flexible PTC element composed of a PTC conductive polymer composition which exhibits PTC behavior and which comprises

(i) a polymer component which comprises a mixture of a first crystalline polymer having a first melting point T_1 and a second melting point T_2 which is at least $(T_1+25)°$ C.; and

(ii) a particulate filler component which has been dispersed in said polymer component and which comprises a conductive filler;

(b) two elongate metal electrodes which are electrically connected to the PTC element so that, when the electrodes are connected to a source of electrical power, current flows through said PTC element; and

(c) surrounding said PTC element and melt-fused thereto, a layer of a second polymeric composition having substantially greater flexibility at 23° C. than said PTC composition.

4,400,615

PROGRAMMABLE COUNTER CIRCUIT

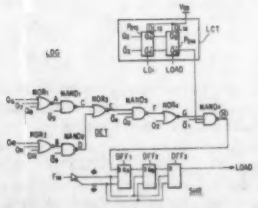
Fumitaka Asami, Kunitachi, and Osamu Takagi, Tokyo, both of Japan, assignors to Fujitsu Limited, Kanagawa, Japan

Filed Dec. 17, 1980, Ser. No. 217,386

Claims priority, application Japan, Dec. 17, 1979, 54-163796

Int. Cl.³ G06F 7/68

U.S. Cl. 377—28 **11 Claims**



1. A programmable counter circuit, operatively connectable to receive a clock signal, comprising:

a counter circuit, operatively connectable to receive the clock signal, having stages, each stage including a flip-flop, each flip-flop having an output, in which an initial value including a specified value is loaded;

a buffer operatively connected to said counter circuit; and

a load signal generator, operatively connected to said buffer, for generating a load signal which is applied by said load signal generator through said buffer to the flip-flop of each stage of said counter circuit and which loads the initial value into said counter circuit, so that said programmable counter circuit serves as an N-step counter dependent on the initial value loaded, wherein said load signal generator comprises:

a detector circuit, operatively connected to the output of each flip-flop of each stage of said counter circuit, for detecting the specified value which is provided a short time before the initial value loading of said counter circuit and for generating a detected output signal;

a shift register, operatively connected to said detector circuit and operatively connectable to receive the clock signal, said shift register shifting upon reception of the detected output signal from said detector circuit, the shifting controlled by the same clock signal as that for driving the counter circuit and said shift register generating the load signal at the moment of the initial value loading of the counter circuit; and

a load control circuit, operatively connected to said counter circuit, for sending out a load inhibit signal and for preventing the application of the output from the detector circuit to said shift register for the duration of the load signal and a predetermined period of time subsequent to the load signal.

4,400,616

DOCUMENT CARD CONTAINING INFORMATION IN HOLOGRAPHIC FORM

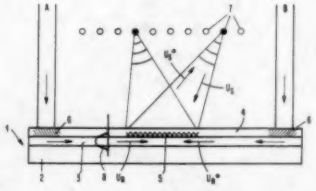
Pierre R. Chevillat, and Fritz Gfeller, both of Adliswil, Switzerland, assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Aug. 17, 1981, Ser. No. 293,069

Claims priority, application European Pat. Off., Aug. 21, 1980, 8010492.8

Int. Cl.³ G06K 19/06

U.S. Cl. 235—487 **5 Claims**



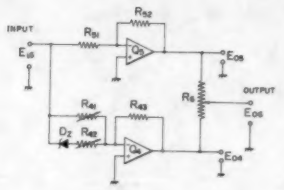
1. A document form comprising a base, a transparent layer overlying said base and forming an optical waveguide defining an elongated light path extending parallel to said base, an image layer contiguously overlying said transparent layer and containing, at a first location along said light path, at least one hologram that is developable in response to light of a given wave length traveling through said wave guide, and means, located at a second location along said light path, for coupling only light of said given wave length from outside said card into said transparent layer, said coupling means comprising a further hologram of a unique light source pattern whereby only light of said unique light source pattern can be coupled to said transparent layer.

4,400,617

CORRECTION CIRCUIT OF A HALFTONE DOT AREA RATE DETECTOR

Yasuhiro Yonekura, Hikone, Japan, assignor to Dainippon Screen Seizo Kabushiki Kaisha, Kyoto, Japan

Filed Nov. 10, 1981, Ser. No. 320,096
Claims priority, application Japan, Dec. 1, 1980, 55-168096
Int. Cl.³ H01J 40/14
U.S. Cl. 250—214 A 2 Claims



1. A correction circuit of a halftone dot area rate detector wherein a relation between a detected halftone dot area rate and a light transmittance or reflectance of an object obtained by a halftone photography is approximately expressed by a turning curve having at least one turning point, which comprises line segments, by using a turning point correction circuit comprising an inverting amplifying circuit, the improvement which comprises:

(a) another inverting amplifying circuit which is coupled in parallel with the turning point correction circuit; and

(b) a potentiometer which couples the outputs of the two circuits and which outputs a signal corresponding to a correction amount.

4,400,618

METHOD OF DETECTING AND ANALYZING DAMAGE IN PRINTED CIRCUIT BOARDS

James R. Bupp, Endwell, and Lawrence R. Maier, Johnson City, both of N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Aug. 6, 1981, Ser. No. 290,632
Int. Cl.³ C09K 11/06; G01N 19/08, 21/16
U.S. Cl. 250—302 6 Claims

1. A method of detecting flaws in a printed circuit board laminate having drilled holes comprising:

applying a penetrating solution containing multifunctional methylacrylates and a UV fluorescing dye to said circuit board laminate to fill drilled holes and flaws therein, said penetrating solution being capable of being polymerized;

removing excess penetrating solution from the drilled holes and the surface of said circuit board laminate;

curing the penetrating solution remaining in the flaws into an insoluble solid;

cross-sectioning the circuit board laminate to provide at least one sample carrying the cured solution;

encapsulating the sample in a clear epoxy;

grinding and polishing said encapsulated sample to provide a surface to be examined; and

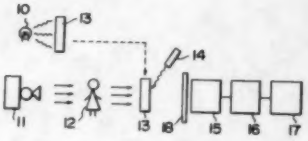
examining said surface under UV light.

4,400,619

METHOD OF AND APPARATUS FOR OBTAINING A RADIATION IMAGE BY USE OF A STIMULABLE PHOSPHER

Noboru Kotera; Shusaku Eguchi, both of Odawara; Masanori Teraoka, Minami-ashigara; Kenji Takahashi, Minami-ashigara, and Junji Miyahara, Minami-ashigara, all of Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed Jul. 11, 1980, Ser. No. 168,795
Claims priority, application Japan, Jul. 11, 1979, 54-87799
Int. Cl.³ G01T 1/11
U.S. Cl. 250—327.2 2 Claims



1. In a radiation image conversion method comprising steps of

exposing a radiation image conversion panel made of stimulable phosphor to a radiation which has passed through an object for causing the panel to absorb the energy of radiation,

exposing the panel to stimulating rays having a wavelength within the range of stimulating light wavelength of the stimulable phosphor for causing the panel to emit the radiation energy absorbed therein as fluorescent light, and

detecting the emitted light,

wherein the improvement comprises

employing as said stimulable phosphor is at least one of the phosphors selected from the group consisting of

(i) fluorohalide phosphor represented by the formula of $(Ba_{1-x},M^{II}_x)FX:yA$ wherein M^{II} is at least one element selected from the group consisting of Mg, Ca, Sr, Zn and Cd, X is at least one element selected from the group consisting of Cl, Br and I, A is at least one element selected from the group consisting of Eu, Tb, Ce, Tm, Dy, Pr, Ho, Nd, Yb and Er, and x and y are numbers satisfying the conditions of $0 \leqq x \leqq 0.6$ and $0 \leqq y \leqq 0.2$,

(ii) oxyhalide phosphor represented by the formula of LnOX:zM wherein Ln is at least one element selected from the group consisting of La, Y, Gd and Lu, M is at least one element selected from the group consisting of Ce and Tb, X is at least one element selected from the group consisting of Cl, Br and I, and z is a number satisfying the condition of $0 < z \leqq 0.1$, and

(iii) divalent metal silicate phosphor represented by the formula of $Me^{II}O.pSiO_2:D$ wherein Me^{II} is at least one element selected from the group consisting of Mg, Ca, Sr, Zn, Cd and Ba, D is at least one element selected from the group consisting of Ce, Tb, Eu, Tm, Pb, Tl, Bi and Mn, and p is a number satisfying the condition of $0.5 \leqq p \leqq 2.5$, and

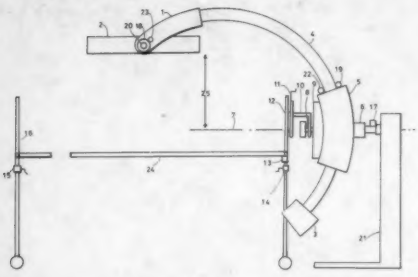
exposing the panel to light having a wavelength within the range of stimulating light wavelength of the stimulable phosphor before the panel is exposed to the radiation, thereby removing the radiation energy remaining in the panel before the panel is exposed to the radiation.

4,400,620

PHOTON EMISSION TOMOGRAPHIC APPARATUS

Alvin S. Blum, 2350 Del Mar Pl., Ft. Lauderdale, Fla. 33301

Continuation-in-part of Ser. No. 163,057, Jun. 26, 1980, Pat. No. 4,368,389, and a continuation-in-part of Ser. No. 204,304, Nov. 5, 1980. This application Oct. 19, 1981, Ser. No. 312,653
The portion of the term of this patent subsequent to Jan. 11, 2000, has been disclaimed.
Int. Cl.³ G01T 1/20
U.S. Cl. 250—363 S 13 Claims



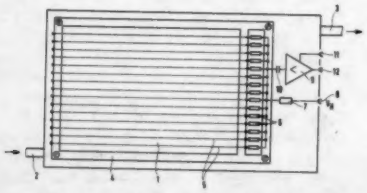
1. A structure for a radiation detector for emission tomography imaging of a radioactive patient comprising: counterbalanced detector support means; rotation means for rotating said detector about an axis and around said patient so as to view said patient from a plurality of angles; radius adjusting means to adjust the radius of rotation of said detector during said rotation around said patient so as to maintain a minimum distance between said detector and said patient to improve image quality.

4,400,621

DETECTOR DEVICE

Hans Kiefer, Eggenstein-Leop., and Hans-Gerd Röber, Karlsruhe, both of Fed. Rep. of Germany, assignors to Kernforschungszentrum Karlsruhe GmbH, Karlsruhe, Fed. Rep. of Germany

Filed Feb. 2, 1981, Ser. No. 230,505
Claims priority, application Fed. Rep. of Germany, Feb. 2, 1980, 3003909
Int. Cl.³ G01T 1/18
U.S. Cl. 250—385 10 Claims



1. A device for simultaneously detecting alpha and beta particles comprising

a detector element for detecting both alpha and beta particles impinging thereon, said alpha and beta particles exhibiting different ionization densities; and

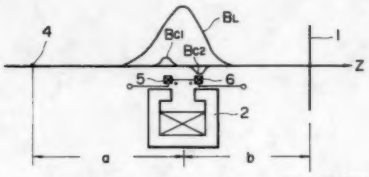
amplification means coupled to the output of said detector element, said amplification means generating a voltage at its output having a rise time and amplitude corresponding to the type of particle impinging on said detector element, said rise time being different for said alpha and beta particles and providing a means for distinguishing therebetween.

4,400,622

ELECTRON LENS EQUIPMENT

Yoshinobu Takeuchi; Katsuhiro Kuroda, both of Hachioji, and Susumu Ozasa, Kashiwa, all of Japan, assignors to Nippon Telegraph & Telephone Public Corporation and Hitachi, Ltd., both of Tokyo, Japan

Filed Jan. 15, 1981, Ser. No. 225,269
Claims priority, application Japan, Jan. 30, 1980, 55-8797
Int. Cl.³ H01J 3/20
U.S. Cl. 250—396 ML 8 Claims



1. An electron lens system comprising:

electron-optical lens means for generating a magnetic field through which an electron beam is to pass;

at least two coils which are juxtaposed along an optical axis in the vicinity of said electron-optical lens means, at least one of said coils being disposed within a magnetic field of said electron-optical lens means; and

means for adjusting the focal distance of said electron-optical lens means by exciting said coils in directions opposite to each other so that an electron beam passing through the magnetic field of said electron-optical lens means does not undergo any rotation ascribable to said electron-optical lens means.

4,400,623

RADIATION ATTENUATION SYSTEM

Earl B. Jacobson, McHenry, Ill., assignor to Nuclear Power Outfitters, Crystal Lake, Ill.

Filed Jan. 2, 1981, Ser. No. 222,082
Int. Cl.³ G21F 3/04
U.S. Cl. 250—517.1 15 Claims

1. A self-supporting modular radiation attenuation system comprising:

a plurality of interengaging radiation attenuation module elements, each element adapted to be substantially filled with a radiation attentuating fluid when positioned where desired;

each of said module elements including complementary interengaging surface portions configured to nest within a substantially complementary portion of an adjacent mod-

ule to substantially eliminate when assembled directed radiation paths between assembled module means while accommodating substantial nested cumulative misalignment; and

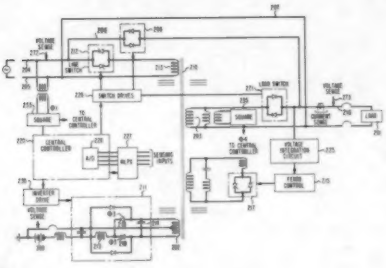
each of said module means including retention means adapted for securing said module means to one another in any desired alignment within the limits of said nested relationship, whereby said elements may be arranged with respect to each other to accommodate and shield an irregular surface.

4,400,624

UNINTERRUPTIBLE POWER SUPPLIES

Harry K. Ebert, Jr., Whippany, N.J., assignor to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed Apr. 29, 1982, Ser. No. 373,133
Int. Cl.³ H02J 9/06
U.S. Cl. 307—43 **17 Claims**



11. An uninterruptible power supply comprising

a regulating transformer having first and second inputs and an output,

means for evaluating acceptability of an AC voltage at the first input means comprising

means for sampling a plurality of amplitudes within each half-cycle of the AC voltage at a plurality of precise angles relative to a zero crossing of the AC voltage,

said means for sampling including means for designating individual sampling intervals at the precise angles of the AC voltage by generating a plurality of timing pulses,

means for evaluating at least two successive ones of the plurality of amplitudes sensed by the means for sampling in order to determine acceptability of the AC voltage, and

means for disabling the first input if the means for evaluating determines the AC voltage to be unacceptable.

4,400,625

STANDBY A-C POWER SYSTEM WITH TRANSFER COMPENSATION CIRCUITRY

Sam W. Hussey, Lakewood, Ohio, assignor to Reliance Electric Company, Cleveland, Ohio

Filed Nov. 30, 1981, Ser. No. 325,974
Int. Cl.³ H02J 9/00
U.S. Cl. 307—66 **16 Claims**

12. A power supply system having an input and an output connected by an A-C voltage transmission means for providing at said output a regulated A-C voltage to an external load connected to said output, which comprises:

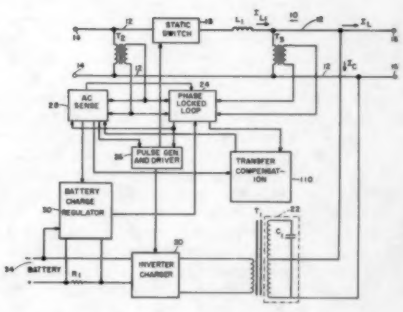
(a) sensing means to sense the A-C voltage waves in said transmission means on the input and output sides of said system, said sensing means being directly connected to said transmission means whereby there is no substantial phase shift between said transmission means and said sensing means;

(b) means responsive only to said input A-C voltage wave for determining the occurrence in said input voltage wave of at least one of a predetermined number of undesirable conditions, said means generating a first signal of predetermined amplitude upon said occurrence and a second signal of predetermined amplitude upon the nonoccurrence of said undesirable conditions;

(c) a switch means interposed in said transmission means between said input and output thereof, said switch means normally operating in a closed condition and being adapted to be selectively inhibited, upon the occurrence of said first signal, to thereby prevent transmission of said input A-C voltage wave to said output;

(d) a standby power system including a bidirectional inverter connected between a battery and said output, said inverter adapted to supply from said battery an A-C voltage wave of predetermined frequency and amplitude to said output during periods when said switch means is inhibited and said inverter adapted to supply current to charge said battery as a load internal to said system when said switch means is operating normally;

(e) a phase control means operating in a loop between said input and said output, said loop being the only loop in said system and fully closed when said switch means operates in a closed condition, said phase control means responsive when said loop is fully closed to said input and output voltage waves and said second signal for controlling the phase relationship between said voltage waves and for generating



a signal which may be used to indicate the total load on said system when said switch means operates normally as the sum of said external load, said phase control means responsive to said first signal for fully opening said fully closed loop and for controlling said frequency and amplitude of said A-C voltage wave supplied by said standby power system; and

(f) a circuit for compensating for the transients which arise in the output voltage when said switch means is inhibited including

(i) means responsive to said total load indicating signal for generating a signal when said switch means operates normally whose amplitude is indicative of said total load;

(ii) means responsive to said selective inhibiting of said switch means for providing a signal to said generating means for changing said load indicative signal amplitude in a predetermined manner;

(iii) means responsive to said selective inhibiting of said switch means for causing said voltage supplied by said inverter when said switch means is inhibited to increase above said predetermined amplitude; and

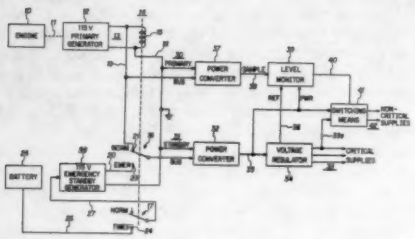
(iv) means responsive to said load indicative signal amplitude reaching a predetermined amplitude for terminating said increase of said voltage generated by said inverter said voltage returning to said predetermined amplitude.

4,400,626

POWER DISTRIBUTION SYSTEM WITH MEANS FOR SENSING EMERGENCY CONDITION AND REDUCING STANDBY POWER

Larry D. Lacy, Walker, Iowa, assignor to Rockwell International Corporation, El Segundo, Calif.

Filed Feb. 24, 1982, Ser. No. 351,724
Int. Cl.³ H02J 7/00
U.S. Cl. 307—66 **3 Claims**



1. In a power supply and distribution system for supplying critical and non-critical outputs to a user system:

first primary power generator means and second emergency standby power generating means, first and second power buses, said first power bus connected to the output of said first power generator means, a first switching means connecting the output of said second bus to the output of said first power generator means when said first power generator means is operative, and connecting the output of said second bus to the output of said second power generating means when said first power generating means is inoperative, sensing monitor means comparing a sample input signal proportional in magnitude to the voltage on said first power bus with a reference signal proportional to the level on said second power bus and generating a control signal output when said sample and reference inputs thereto exhibit a predetermined discrepancy therebetween, further switching means through which at least a portion of power supply output lines supplied from said second bus are disconnected from said user system in response to said control signal output from said sensing monitor means,

said first bus connected to a first power conversion means to provide said sample input to said sensing monitor means, said second bus connected to a second power conversion means and a power regulator circuitry from which critical power output is supplied said user system and a reference input is supplied to said sensing monitor means, the output of said second power conversion means being connected as a power input to said sensing monitoring means and to said second switching means, and with non-critical power output from said second power conversion means and said power regulator circuitry being connected through said second switching means to said user system.

4,400,627

TELEPHONE SWITCHING NETWORK

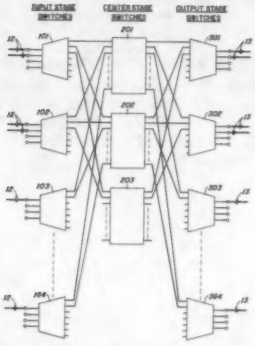
Meyer J. Zola, Oak Park, Ill., assignor to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed May 4, 1981, Ser. No. 260,004
Int. Cl.³ H04Q 3/00
U.S. Cl. 307—115 **7 Claims**

1. A method of growth for a switching network, which switching network comprises an input stage comprising up to M input stage switches, each comprising input terminals and output terminals, a first center stage switch having up to M input and up to M output terminals, and up to M output stage switches, each comprising input terminals and output terminals, when up to M incoming and M outgoing lines are to be connected thereto, said method comprising:

(A) connecting each incoming line to one input terminal of one of said input stage switches, which input stage switch is not already connected to an incoming line;

(B) connecting one output terminal of each of said input stage switches connected in Step A to one input terminal of said first center stage switch;



(C) connecting, for each performance of Step B, one output terminal of said first center stage switch to one input terminal of one of said output stage switches, which output stage switch is not already connected to said first center stage switch; and

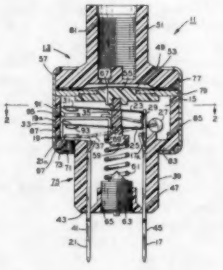
(D) connecting one output terminal of each output stage switch connected in Step C to one of said outgoing lines.

4,400,628

CONTROL DEVICE AND METHOD OF MAKING

George E. Morris, Sterling, and Stewart A. Woodward, Morrison, both of Ill., assignors to General Electric Company, Fort Wayne, Ind.

Filed Feb. 16, 1982, Ser. No. 349,330
Int. Cl.³ H01H 35/18, 35/40
U.S. Cl. 307—118 **25 Claims**



8. A control device comprising:

a housing having an electrical circuit therethrough;

at least a pair of switch means within said housing and operable generally between a pair of switching modes for controlling said electrical circuit through said housing;

resistor means adapted for energization in said electrical circuit, said resistor means being connected in series circuit relation with one of said switch means upon the operation of said one switch means to one of the switching modes thereof and also in parallel circuit relation with the other of said switch means upon the operation of said

other switch means to one of the switching modes thereof; and

means for sequentially operating said switch means to the one switching mode thereof, respectively, to energize said resistor means in said electrical circuit in the series circuit relation with said one switch means prior to the connection of said resistor means in the parallel circuit relation with said other switch means.

4,400,629

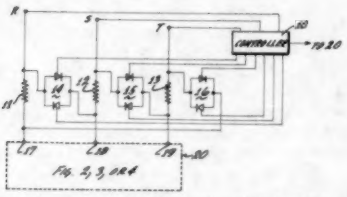
DELTA-STAR CONNECTION

Ernst Kratzmair, Munich, Fed. Rep. of Germany, assignor to Schaltbau Gesellschaft mbH, Munich, Fed. Rep. of Germany

Continuation-in-part of Ser. No. 288,814, Jul. 31, 1981, abandoned. This application Jul. 2, 1982, Ser. No. 394,632

Int. Cl.³ H02B *1/24*

U.S. Cl. 307—127 **7 Claims**



1. A circuit for the selective connection of a three-phase load in a delta and a star circuit connection, comprising:

a first group of controllable semiconductor elements connected to said three-phase load for completing a delta circuit for the three-phase load;

a second group of controllable semiconductor elements connected to ends of the three-phase load for completing a star circuit for the three-phase load; and

control circuit means connected to the elements of said first and second groups and providing firing pulses to said elements for always operating both of said groups but with different firing delays.

4,400,630

FREQUENCY MULTIPLIERS

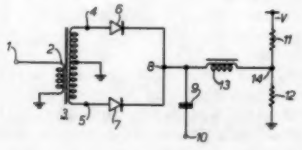
David P. Owen, Dunstable, England, assignor to Marconi Instruments Limited, Chelmsford, England

Filed Dec. 8, 1980, Ser. No. 214,026

Claims priority, application United Kingdom, Dec. 6, 1979, 7942171

Int. Cl.³ H03B *19/00*

U.S. Cl. 307—219.1 **3 Claims**



1. A frequency multiplier including a diode network comprising two Schottky barrier diodes connected together via corresponding electrodes to a common output point and each of which is arranged to rectify a high frequency, amplitude modulated signal applied to the network, the rectified signals being combined at the output point to produce an alternating signal having an even multiple of the frequency of the applied signal; means for providing a d.c. voltage bias of an amplitude sufficient to forward bias said diodes to at least their current conduction threshold; and a low pass filter composed of inductor means connected in series between said d.c. voltage bias providing means and said common output point, said filter means having an upper cutoff frequency below the frequency of the signal applied to said network, for supplying the d.c. voltage bias to said common output point while isolating said d.c. voltage bias providing means from the alternating signal produced at said common output point in order to cause the d.c. voltage bias to permanently bias said diodes and to reduce distortion of the amplitude modulation of the signal applied to said network.

4,400,631

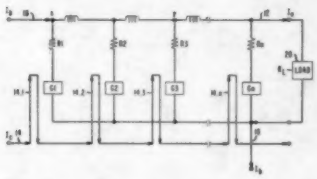
HIGH CURRENT GAIN JOSEPHSON JUNCTION CIRCUIT

Theodore A. Fulton, Warren Township, Somerset County, N.J., assignor to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed Feb. 12, 1981, Ser. No. 233,949

Int. Cl.³ H03K *17/92, 19/195, 3/38*

U.S. Cl. 307—245 **4 Claims**



1. A high current gain superconductive circuit for diverting bias current from a shunt branch to an output branch comprising:

a plurality n of Josephson junction gates connected in said shunt branch in parallel with each other, each of said gates capable of being switched from a low impedance state to a high impedance state by the application thereto of a magnetic field which depresses the critical current of said gates below the bias current flowing therethrough, each of said gates also being individually capable of diverting said bias current to said output branch when switched to said high impedance state,

electrode means for causing bias current to flow through said gates at a level below said critical currents, and

control means comprising a single control signal source coupled to a single control line for applying said magnetic field essentially simultaneously and directly to a second plurality k of said gates, where $2 \leqq k \leqq n$, thereby diverting said bias current to said output branch.

4,400,632

METHOD AND LOGIC CIRCUIT FOR CONVERTING SIGNALS

Jury K. Kushner, ulitsa Khersonskaya, 25, kv. 62, Moscow, U.S.S.R.

Continuation of Ser. No. 950,281, Oct. 11, 1978. This application Sep. 28, 1981, Ser. No. 306,472

Int. Cl.³ H03K *19/20*

U.S. Cl. 307—299 A **7 Claims**

1. A logic circuit for performing the AND, OR and AND-OR logic functions, comprising:

plural logic circuit inputs and true outputs;

current source means coupled to said logic circuit inputs;

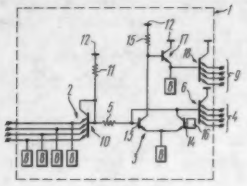
a first resistor;

a second resistor;

a voltage source;

an output emitter follower comprising an output multiple-emitter transistor having an input and plural outputs, said plural outputs being coupled to said true outputs of said logic circuits; and

an input multiple-emitter transistor having plural emitters, a base, and a collector, said plural emitters being coupled to said logic circuit inputs, said collector being coupled to



said input of said output emitter follower, said base being coupled to said collector via said first resistor and to said voltage source via said second resistor.

4,400,633

LEVEL DETECTION CIRCUIT

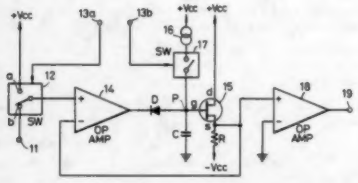
Tomohiro Mouri, Musashino, Japan, assignor to Victor Company of Japan Ltd., Kanagawa, Japan

Filed Oct. 2, 1980, Ser. No. 193,523

Claims priority, application Japan, Oct. 3, 1979, 54-127730

Int. Cl.³ G01R *19/04, 19/30*

U.S. Cl. 307—351 **5 Claims**



1. A level detection circuit comprising:

a peak value detection and holding circuit having a single capacitor and a diode, for detecting and holding the peak value of an input signal by charging said capacitor;

operation control means for supplying said input signal to said peak value detection and holding circuit during a specific time interval to perform maximum peak value detection and holding operation, said maximum peak value occurring during said specific time interval;

a discharge circuit for performing constant current discharge of the charge in said capacitor of said peak value detection and holding circuit, said discharge being initiated at a time point after said specific time interval; and

means for providing an indication of a time point when the terminal voltage of said capacitor during discharge reaches a specific voltage whereby the level of said input signal can be determined by the value of the time interval between the time point when the constant current discharge of said capacitor is initiated and the time point when the terminal voltage of the capacitor reaches said specified voltage.

4,400,634

BIMORPH TRANSDUCER MADE FROM POLYMER MATERIAL

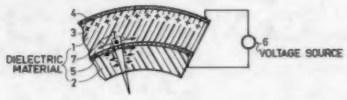
Francois Micheron, Paris, France, assignor to Thomson-CSF, Paris, France

Filed Dec. 9, 1980, Ser. No. 214,723

Claims priority, application France, Dec. 28, 1979, 79 31970

Int. Cl.³ G11C *13/02*

U.S. Cl. 307—400 **11 Claims**



1. A bi morph transducer, whose active areas comprise:

at least two sheets joined along an interface, one of said sheets being made from a dielectric polymer material carrying an excess of electric charge, and

two electrodes for creating an electrical field across the thickness of said charged material, wherein the joining of said sheets prevents them from sliding against each other, the elastic characteristics of said sheets being differentiated for causing said active areas to bend under the action of said electrical field; one of said electrodes being located at said interface.

4,400,635

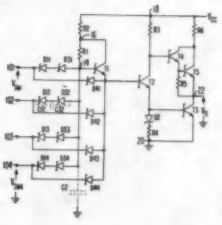
WIDE TEMPERATURE RANGE SWITCHING CIRCUIT

James D. Mazgy, Parsippany, N.J., assignor to RCA Corporation, New York, N.Y.

Filed Jan. 21, 1981, Ser. No. 227,147

Int. Cl.³ H03K *19/088, 19/40*

U.S. Cl. 307—445 **7 Claims**



1. The combination comprising:

first and second operating voltage terminals;

a signal input terminal;

an internal node;

m transistors, each transistor having a base, an emitter, and a collector; means connecting the base-to-emitter paths of said m transistors in series between said internal node and said first operating voltage terminal, all the base-to-emitter paths being poled to conduct forward current in the same direction;

first means for conducting a current connected between said second operating voltage terminal and said internal node;

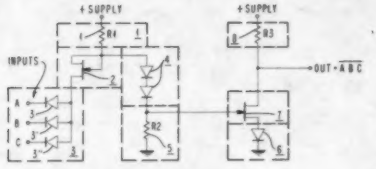
(m−1) diodes, poled to conduct forward current in a direction opposite to the forward current flow direction in the base-to-emitter paths to said m transistors, said (m−1) diodes being connected in series between said internal node and said input terminal; where m is an integer greater than 2; and

means coupling the collectors of said m transistors to said second operating voltage terminal.

4,400,636
THRESHOLD VOLTAGE TOLERANT LOGIC

Thomas L. Andrade, Oakton, Va., assignor to IBM Corporation, Armonk, N.Y.

Filed Dec. 5, 1980, Ser. No. 213,440
Int. Cl.³ H03K 19/094, 19/003, 19/12, 19/20
U.S. Cl. 307—446 12 Claims



1. An integrated circuit logic gate formed on a semiconductor substrate, comprising:

a first enhancement mode MESFET device having a threshold voltage deviation from a nominal threshold voltage value and having its source terminal connected to a first logical input and its drain and gate terminals connected to a first node;

a first impedance connected between said first node and the first potential forming a current source;

a second impedance connected between said first node and a second potential forming a current sink, the resultant voltage at said first node deviating from a nominal first voltage in response to said threshold voltage deviation of said first MESFET device;

a second enhancement mode MESFET device formed in close proximity to said first MESFET device and having a threshold voltage deviation from said nominal threshold voltage substantially equal to said threshold voltage deviation of said first MESFET device and having its gate connected to said first node, its source connected to said second potential, and its drain connected to an output terminal for the circuit;

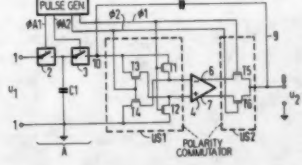
a third impedance connected between said output terminal and said first potential for conducting current to said output node, the resultant voltage at said output node being substantially equal to a nominal output voltage in response to said deviation of said voltage at said first node compensating for the effect of said threshold voltage deviation of said second MESFET device;

whereby a logical inverter function can be performed by the circuit.

4,400,637
INTEGRATOR WITH SAMPLING STAGE

Heinrich Klar, and Berward Roessler, both of Munich, Fed. Rep. of Germany, assignors to Siemens Aktiengesellschaft, Berlin & Munich, Fed. Rep. of Germany

Filed Apr. 8, 1981, Ser. No. 252,048
Claims priority, application Fed. Rep. of Germany, Apr. 30, 1980, 3016737
Int. Cl.³ G06G 7/186
U.S. Cl. 307—497 7 Claims



1. An integrator with a switched - capacitor sampling stage at the input of said integrator, said sampling stage having a first capacitor having one lead interconnected between first and second alternatingly opened electronic switches and said integrator having at least one amplifier stage having a feedback path containing a feedback capacitor which is connected to an output of said sampling stage, said integrator further comprising:

a first polarity commutator interconnected between the output of the sampling stage and an input of a first amplifier stage, said first polarity commutator selectively switching the polarity of a first signal supplied from said sampling stage for forming a first commutator output signal which is supplied to said input of a first amplifier stage, the polarity of said first commutator output signal being the same as or the opposite of the polarity of said first signal depending on the switching state of said first polarity commutator;

a second commutator connected to an output of at least one of said amplifier stages for selectively switching the polarity of an amplifier output signal appearing at the output of said one of said amplifier stages, said amplifier output signal being derived from said first commutator output signal through said first amplifier stage and any following amplifier stages including said one of said amplifier stages, said amplifier output signal being transformed by said second polarity commutator for forming a second commutator output signal, the polarity of said second commutator output signal being the same as or opposite the polarity of said amplifier output signal depending on the switching state of said second polarity commutator;

said feedback path being connected to an output of said second polarity commutator for supplying said second commutator output signal to said feedback capacitor; and

a clock means connected to said first and second electronic switches and to said first and second polarity commutators for alternatingly opening and closing said first and second switches for forming a polarity of said first signals, and for operating said first and second polarity commutators for switching the polarities of said first signals and said amplifier output signals derived therefrom for mutually compensating the influences of said first and second polarity commutators on said second commutator output signals, said second commutator output signals being summed by said feedback capacitor for forming an output signal for said integrator such that noise voltages from said first amplifier stage have respective repeatedly switched polarities depending on the sequence of switching states of said second polarity commutator, thereby being substracted from each other by said feedback capacitor so as to be suppressed.

4,400,638
SHAFT MOUNTED EDDY CURRENT DRIVE

James W. Albrecht, Centerville, Ohio, and Harold G. Spriggs, Farmers Branch, Tex., assignors to Stromag, Inc., Dayton, Ohio

Filed Aug. 20, 1981, Ser. No. 294,586
Int. Cl.³ H02K 49/00
U.S. Cl. 310—95 7 Claims

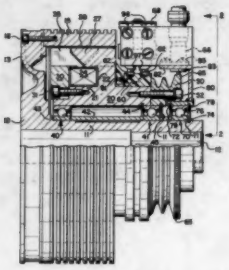
1. An electrical variable speed drive including a hub member adapted for mounting to the drive shaft of a prime mover, a driven body member rotatably supported on said hub member and having a mechanical power output drive portion such as a pulley, an electric coil associated with one of said members, magnetic pole means on said last named member positioned in closely spaced relation to a magnetic armature portion of the other member whereby the extent of coupling between the members is affected by the application of electric current to said coil, and slip ring means for applying current to said coil, the improvement comprising:

bearing means mounted on said hub member,

a brush holder support mounted on said bearing means,

torque means supporting said brush holder support in non-rotating relationship, and

a brush holder mounted on said brush holder support having



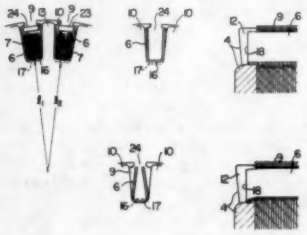
brushes in engagement with said slip ring means so that displacements in the position of said hub member when rotated by the drive shaft uniformly affect the slip ring means and the brush holder.

4,400,639

ROTOR CORE OF ELECTRIC ROTARY MACHINE

Junichi Kobayashi, Funabashi; Takao Mifune, Ichikawa, and Shoji Tanabe, Sakura, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Nov. 26, 1980, Ser. No. 210,811
Claims priority, application Japan, Nov. 28, 1979, 54-152951
Int. Cl.³ H02K *3/34*
U.S. Cl. 310—215 3 Claims



1. A rotor of an electric rotary machine comprising:

a rotor core having a plurality of slots opening toward the outer peripheral surface of the rotor core and teeth formed between the slots;

a spidery end plate located at a side of said rotor core and having notches opposing said slots and projections opposing said teeth;

a rotor winding buried in said slots and said notches and tightly wound about said rotor core and said spidery end plate; and

slot cell insulators, formed individually and separate from said spidery end plate, provided between said rotor winding and said rotor core, the distance from the axis of said rotor core to a bottom of said notch being made slightly longer than that to a bottom of said slot, and each of said slot cell insulators being formed of an insulating sheet, an end of which is placed into said notch;

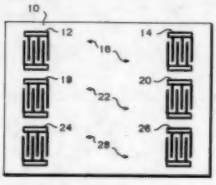
each of said projections of said spidery end plate having an end surface thereof which faces away from said rotor core when looking in the axial direction of said rotor core, said end surface being inclined progressively further away from the end surface of said rotor core as it becomes more distant from the axis of said rotor core at least along a portion thereof extending outward from the bottom of the notch in the radial direction of the rotor core.

4,400,640

TEMPERATURE STABLE CUTS OF QUARTZ

Frederick Y. Cho, Scottsdale, Ariz., and Dylan F. Williams, Berkeley, Calif., assignors to Motorola Inc., Schaumburg, Del.

Filed May 17, 1982, Ser. No. 378,668
Int. Cl.³ H01L *41/08*
U.S. Cl. 310—313 A 5 Claims



1. A temperature stable cut of quartz chosen from the group consisting of:

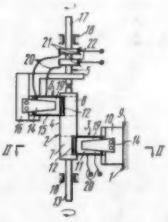
the families (YXwlt) 0/27/138, 7/27/135.5, 15/40/40, 15/30/38, 12.5/35/130 and rotational equivalents thereof.

4,400,641

PIEZOELECTRIC MOTOR WITH TWO PART ROTOR

Vladimir S. Vishnevsky; Vitaly S. Koval; Vyacheslav V. Lavrinenko; Oleg L. Boichenko; Igor A. Kartashev; Jury V. Golovyashin; Nikolai F. Serov; Leonid I. Shinkarenko, and Oleg G. Jurash, all of Kiev, U.S.S.R., assignors to Kievsky Politekhnichesky Institut, Kiev, U.S.S.R.

Filed Apr. 16, 1982, Ser. No. 369,181
Int. Cl.³ H01L *41/08*
U.S. Cl. 310—323 44 Claims



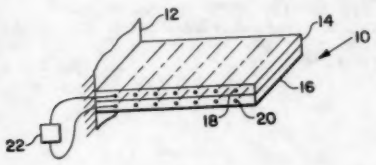
1. A piezoelectric motor comprising a stator and a rotor one of which includes at least one first piezoelectric oscillator including a piezoelectric element having a working surface, the rotor consisting of a first and a second parts, one of which parts including at least one second piezoelectric oscillator having a piezoelectric element having a working surface, said first and second parts of the rotor being capable of mutually rotating with respect to the axis of rotation of the rotor, said first part of the rotor being in contact with the stator on the first surface of the frictional interaction provided by rotation of at least one length of a straight line about the axis of rotation of the rotor and with said second part of said rotor on a second surface of frictional interaction provided by rotation of at least one length of a straight line about the axis of rotation of said rotor.

4,400,642

PIEZOELECTRIC COMPOSITE MATERIALS

Louis J. Kiraly, Brookpark, Ohio, assignor to The United States of America as represented by the Administrator of the National Aeronautics and Space Administration, Washington, D.C.

Filed Jul. 12, 1982, Ser. No. 397,281
Int. Cl.³ H04R 17/00; H01L 41/04
U.S. Cl. 310—332 8 Claims



1. A laminated structural device having the ability to change shape, position and resonant frequency without using discrete motive components comprising

piezoelectrically active composites laminated together, each of said piezoelectrically active composites containing at least one electrically conductive member, and

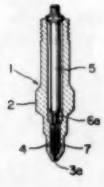
means for selectively placing a predetermined level of charge in said electrically conductive member thereby inducing a distortion in each of said piezoelectrically active composites whereby the device is deformed in a controlled manner.

4,400,643

WIDE THERMAL RANGE SPARK PLUG

Kanemitsu Nishio, Komaki; Shunichi Takagi, Tajimi, and Yasuhiko Suzuki, Nagoya, all of Japan, assignors to NGK Spark Plug Co., Ltd., Nagoya, Japan

Filed Nov. 12, 1980, Ser. No. 205,912
Claims priority, application Japan, Nov. 20, 1979, 54-150259; Dec. 18, 1979, 54-164352; Dec. 21, 1979, 54-165701
Int. Cl.³ H01T 13/16, 13/20
U.S. Cl. 313—11.5 31 Claims



1. A spark plug comprising an insulator body having a center bore therethrough, a bottom end defining a discharge end of the insulator body and a discharge center electrode formed in the discharge end,

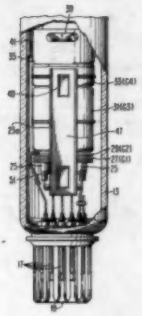
wherein a thermal conductivity-controlling material comprising a spherical metal powder as an essential element thereof is charged into the center bore at the discharge end thereof, said material being adapted to control the thermal conductivity of the spark plug over a wide temperature range.

4,400,644

SELF-INDEXING INSULATING SUPPORT RODS FOR AN ELECTRON GUN ASSEMBLY

John R. Hale, Lancaster, Pa., assignor to RCA Corporation, New York, N.Y.

Filed Apr. 29, 1981, Ser. No. 258,740
Int. Cl.³ H01J 19/42, 29/46, 1/88
U.S. Cl. 313—256 5 Claims



1. In an electron-gun assembly having at least one generally longitudinally-extending electron beam path, said assembly comprising at least two elongated electrically-insulating support rods each rod having a mounting surface and a beading support surface with a plurality of electrodes attached by mounting means to said mounting surfaces of each of said support rods, the improvement wherein

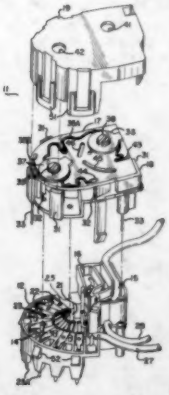
at least two indexing cavities are formed in said beading support surface of each of said support rods, whereby said rods are aligned along said beam path.

4,400,645

CRT SOCKET ASSEMBLY

Stephen J. Simovits, Jr., Downers Grove, and Christ J. Dumas, Forest View, both of Ill., assignors to American Plasticraft Company, Chicago, Ill.

Filed Jul. 6, 1981, Ser. No. 280,682
Int. Cl.³ H01J 29/96
U.S. Cl. 313—325 5 Claims



1. A cathode ray tube socket for use with a tube having terminal pins normally operating at varying potentials and including means for developing controlled arc gaps for selected ones of said pins, said socket comprising a base, a sup-

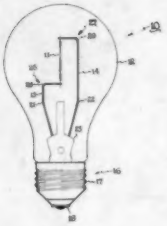
port member mounted on said base and a cover, a low-voltage arc-gap module mounted on said base, a high-voltage arc gap module mounted in said base, a plate having an electronic circuit formed thereon mounted on said support, said electronic circuit comprising a resistive element, wiper contactors mounted on said plate, said cover enclosing said plate, said support on a portion of said base, said wiper elements providing a means of selectively coupling a voltage from said resistive element to selected ones of said terminal pins.

4,400,646

SHAPED INLEAD WIRES IN ELECTRIC LAMPS

Edwin J. Lohrey, Euclid, Ohio, assignor to General Electric Company, Schenectady, N.Y.

Filed Mar. 9, 1981, Ser. No. 241,921
Int. Cl.³ H01J 5/50
U.S. Cl. 313—333 **5 Claims**



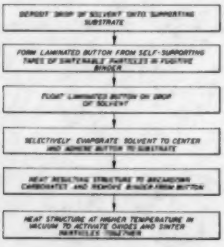
1. An electrical lamp comprising a light source and inlead wires supporting said light source, at least one of said inleads being provided with a compound bend, said compound bend being comprised of a main and a reverse bend both of which are interrelated, said main bend being placed at a location along said inlead wire and defining two divergent segments of said inlead which are interconnected by a corner section having a desired angle, said reverse bend being located at said corner section and extending into the region between said divergent segments.

4,400,647

CATHODE STRUCTURE FOR CATHODE RAY TUBES AND METHOD

George Palty, Seneca Falls, N.Y., assignor to North American Philips Consumer Electronics Corp., New York, N.Y.

Filed Aug. 24, 1981, Ser. No. 295,877
Int. Cl.³ H01J 1/02
U.S. Cl. 313—355 **10 Claims**


DEPOSIT DROP OF SOLVENT ONTO SUPPORTING SUBSTRATE
FORM LAMINATED BUTTON FROM SELF-SUPPORTING THREE OF SINTERABLE PARTICLES IN FUGITIVE BINDER
FLOAT LAMINATED BUTTON ON DROP OF SOLVENT
SELECTIVELY EVAPORATE SOLVENT TO CENTER AND ADHERE BUTTON TO SUBSTRATE
HEAT RESULTING STRUCTURE TO DECOMPOSE CARBONATES AND REMOVE BINDER FROM BUTTON
HEAT STRUCTURE AT HIGHER TEMPERATURE IN VACUUM TO ACTIVATE OXIDES AND SINTER PARTICLES TOGETHER

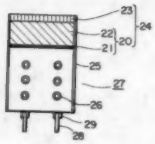
1. A cathode structure for cathode ray tubes comprising:
(a) a supporting substrate of a nickel alloy; and
(b) a multilayer electron emissive structure adherent to the substrate, characterized in that the electron emissive structure is formed from a laminate of at least two self-supporting layers, each layer comprised of particles of an electron emissive material dispersed in a fugitive organic binder matrix.

4,400,648

IMPREGNATED CATHODE

Sadanori Taguchi, Tokyo; Yukio Honda, Fuchu; Toshiyuki Aida, Chofu, and Ushio Kawabe, Tokyo, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Oct. 1, 1980, Ser. No. 192,870
Claims priority, application Japan, Oct. 1, 1979, 54-125403
Int. Cl.³ H01J 1/14
U.S. Cl. 313—346 R **11 Claims**



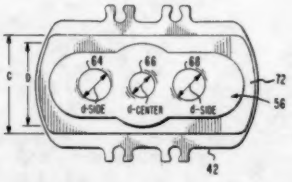
1. An impregnated cathode comprising a complex porous body having a partition layer, an impregnated layer arranged in close contact with the partition layer and made of a porous material containing an electron emissive material, and a penetration layer arranged in contact with the surface of the impregnated layer not adjacent the partition layer; said complex porous body being formed by press-molding powdered material for making said partition layer, said impregnated layer and said penetration layer to form three layers, and sintering the three layers together to obtain said complex porous body; said complex porous body being mounted in a metal sleeve such that said partition layer is arranged to face a heater which is arranged in said metal sleeve; wherein the partition layer is made of a porous material having a porosity of at least about 2% and less than 17% and the penetration layer is made of a porous material having a porosity of 17–30% and in which the porosity of the porous material making said impregnated layer is made larger than that of the porous material making said penetration layer.

4,400,649

COLOR PICTURE TUBE HAVING AN IMPROVED EXPANDED FOCUS LENS TYPE INLINE ELECTRON GUN

Hsing-Yao Chen, Landisville, Pa., assignor to RCA Corporation, New York, N.Y.

Filed Jul. 10, 1981, Ser. No. 282,231
Int. Cl.³ H01J 29/50, 29/62
U.S. Cl. 313—414 **3 Claims**



1. In a color picture tube having an inline electron gun for generating and directing three electron beams, a center beam and two side beams, along coplanar paths toward a screen of said tube, said gun including a main focus lens for focusing said electron beams, the main focus lens being formed by two

spaced electrode members each having three separate inline apertures therein, each electrode also including a peripheral rim, the peripheral rims of the two electrodes facing each other, and the apertured portion of each electrode being within a recess set back from the rim, the improvement comprising

the width of the recess in at least one of the electrodes being wider at the center beam path than at the side beam paths, measured perpendicular to the plane containing the electron beam paths.

4,400,650

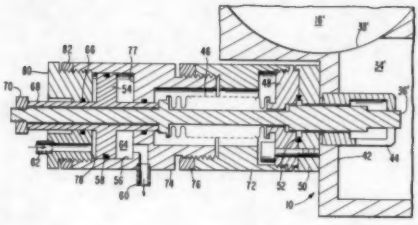
ACCELERATOR SIDE CAVITY COUPLING ADJUSTMENT

Robert H. Giebeler, Jr., Sunnyvale, Calif., assignor to Varian Associates, Inc., Palo Alto, Calif.

Filed Jul. 28, 1980, Ser. No. 172,919

Int. Cl.³ H01J *25/10*

U.S. Cl. 315—5.41 **6 Claims**



1. In a coupled-cavity standing-wave linear particle accelerator having a resonant coaxial side cavity mutually coupled to two adjacent accelerating cavities, means for adjusting the extension into said side cavity of a conductive center post of said cavity comprising: an axially slidable stem supporting said center post, means for making a radio-frequency connection between said center post and a wall of said side cavity, axially flexible bellows means sealed between said stem and said wall for maintaining vacuum in said side cavity, fluid actuated piston means attached to said stem for axially propelling said center post, first adjustable stop means for fixing the maximum inward motion of said post, and second adjustable stop means for fixing the maximum outward motion of said post.

4,400,651

METHOD AND CIRCUIT FOR OPERATING AN INCANDESCENT LAMP

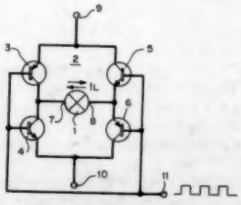
Gunther Nelle, Bergen, Fed. Rep. of Germany, assignor to Dr. Johannes Heidenhain GmbH, Traunreut, Fed. Rep. of Germany

Continuation of Ser. No. 6,886, Jan. 26, 1979, abandoned. This application Sep. 30, 1981, Ser. No. 307,314

Claims priority, application Fed. Rep. of Germany, Feb. 4, 1978, 2804839

Int. Cl.³ H05B *39/09*

U.S. Cl. 315—205 **14 Claims**



1. A method for operating an incandescent, miniature coil lamp in an electro-optical device, the device including a scanning photosensor and a scale, wherein the lamp is arranged to illuminate the scale, the method comprising the step of:

applying an operating voltage to the incandescent lamp, which voltage abruptly and repeatedly alternates between first and second polarities such that the magnitude of the voltage is maintained at a substantially constant value effective to increase the life of the lamp while generating effectively constant luminosity.

4,400,652

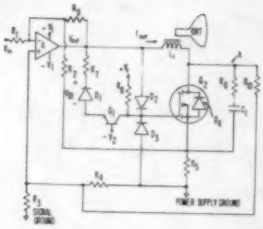
MAGNETIC DEFLECTION SWEEP AMPLIFIER WITH INTELLIGENT FLYBACK

Richard A. Sunderland, Aloha, Oreg., assignor to Squibb Vitatek, Inc., Hillsboro, Oreg.

Filed May 3, 1982, Ser. No. 373,834

Int. Cl.³ H01J *29/70, 29/72*

U.S. Cl. 315—387 **9 Claims**



1. A magnetic deflection circuit for a CRT display comprising:

(a) an amplifier having an input and an output;

(b) an inductive yoke which receives at one terminal an input signal from the output of said amplifier;

(c) a capacitor connected to the other terminal of said yoke, the other side of said capacitor being connected to means for returning the output signal to said input of said amplifier;

(d) means for sensing the current flow through said yoke;

(e) switch means for selectively shorting said capacitor, said switch means having a low resistance state and a high resistance state; and

(f) a diode connected across said switch means, said diode permitting unidirectional current flow when said switch means is in its high resistance state; and

(g) control means for selectively controlling said switch means in response to the output voltage of said amplifier, said control means placing said switch means into its high resistance state when the desired yoke current has a value, relative to the actual yoke current, such that said diode does not permit current flow.

4,400,653

RESONANT SCAN DEFLECTION CIRCUIT WITH FLYBACK VOLTAGE LIMITING

H. Wayne Olmstead, Hillsboro, Oreg., assignor to Tektronix, Inc., Beaverton, Oreg.

Filed Mar. 24, 1982, Ser. No. 361,177

Int. Cl.³ H01J *29/70, 29/76*

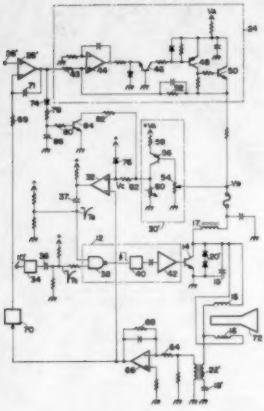
U.S. Cl. 315—408 **4 Claims**

1. A protective circuit for use with a resonant type deflection circuit, including a voltage source for providing a controllable voltage, a deflection coil connected to the voltage source, a deflection transistor connected to one end of the deflection coil, and a deflection transistor driving circuit connected to the deflection transistor and having an input terminal for connection to a sync pulse generator for driving the transistor into a

switched condition in response to a sync pulse received from the sync pulse generator, said protective circuit comprising:

current sensing means for connection in series with the deflection coil for sensing the magnitude of the current in the deflection coil and for developing a voltage representative of the sensed current;

compensating means for connection to the voltage source for compensating for variations in the turn-off delay time of the deflection transistor at different scanning rates of the sync pulses from the sync pulse generator and for developing a voltage in accordance therewith in response thereto; and



comparator means connected to said current sensing means and to said compensating means for comparing the voltage developed by said current sensing means and the voltage developed by said compensating means and for developing an output signal in accordance with the comparison and, in use, for applying said output signal to the deflection transistor driving circuit for driving the deflection transistor into its switched condition when the output signal from said comparator means is received by the deflection transistor driving circuit before the sync pulse is received thereby;

whereby the deflection transistor is protected from an excessively large flyback voltage.

4,400,654

DIGITAL SPEED CONTROL FOR A BRUSHLESS DC MOTOR

Mark L. Elliott, Richfield, Minn., assignor to Magnetic Peripherals Inc., Minneapolis, Minn.

Filed Mar. 27, 1981, Ser. No. 248,644
Int. Cl.³ H02P *5/06*
U.S. Cl. 318—312 **1 Claim**

1. A digital motor speed control comprising:

sensor means for producing a periodic sensor output on rotation of a motor's rotor;

timing means for measuring the time, T, between sensor outputs including counter means for counting from an initialized count in response to receipt of a first sensor output;

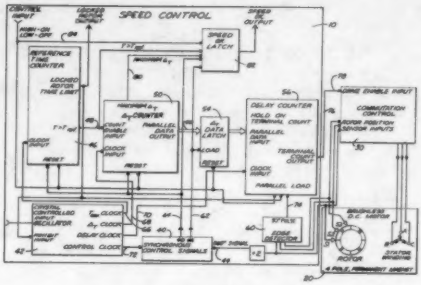
comparison means for measuring how much the sensor output time, T, is greater than a reference time T_{ref} including means for comparing the count of said counter means with a predetermined count, T_{ref}, means responsive to said counts being substantially equal for outputing a T_{ref} signal;

delta-T counter means for counting from an initialized count on receipt of said T_{ref} signal and ending counting in response to receipt of a second sensor output, the ending count comprising a delta-T count;

delta-T latch means for retaining said delta-T count between two sensor outputs;

means for dividing the time between two sensor outputs into a predetermined number of fixed periods and means for outputing a pulse signal at the end of each period;

pulse-delay timing means for delaying the on-time of power in a periodic application of power to the motor including



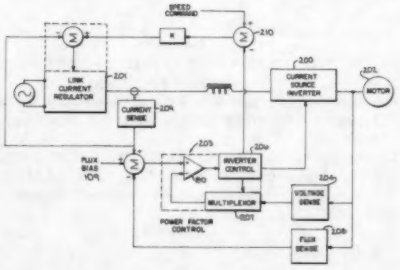
means responsive to said comparison means for reducing the amount of delay in proportion to the greatness of the difference between the sensor output time, T, and the reference time, T_{ref}, which includes delay-counter means for periodically loading the delta-T count from said delta-T latch in response to said pulses and means for counting up from there to a predetermined count, and means for then enabling power application to said motor.

4,400,655

SELF GENERATIVE VARIABLE SPEED INDUCTION MOTOR DRIVE

William P. Curtiss, Winthrop, and Gordon P. Sharp, Newton, both of Mass., assignors to IMEC Corporation, Boston, Mass.

Filed May 11, 1981, Ser. No. 262,742
Int. Cl.³ H02P *5/40*
U.S. Cl. 318—729 **26 Claims**



1. An induction motor drive which comprises:

an inverter having outputs connected to the stator windings of the motor to be controlled, the inverter being operable in response to command signals to apply an alternating current to each of said motor windings;

voltage sensing means coupled to said motor stator windings and being operable to generate quasi sinusoidal feedback signals related to the phase of the stator winding voltages;

power factor control means connected to receive the feedback signals and being operable in response thereto to generate command signals to said inverter which control the phase of the alternating currents the inverter applies to each of said motor windings;

means for sensing the magnitude of the stator winding current and generating a signal proportional thereto;

means for sensing the magnitude of the magnetic flux generated by the motor stator windings and generating a signal proportional thereto; and

power factor selection means connected to receive said stator winding current signal and said magnetic flux signal and being operable in response thereto to select the power factor operating point of said power factor control means such that the magnetic flux signal is controlled as a function of said stator winding current signal.

4,400,656

LIFTING DEVICE FOR DRIVING A LOAD

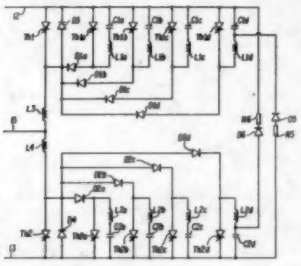
Arnoldus T. H. Duis, Bladel, Netherlands, assignor to Eldurail Industrie en Handelsonderneming B.V., Bladel, Netherlands

Filed Dec. 10, 1980, Ser. No. 214,980

Claims priority, application Netherlands, Dec. 22, 1979, 7909300

Int. Cl.³ H02P *5/40*

U.S. Cl. 318—798 **13 Claims**



1. A device for driving a load, comprising:

a converter for converting a main supply voltage into positive and negative buffer voltages;

an inverter for converting the buffer voltages into a control-voltage for application to at least one load connected to the device;

a control-device for controlling the frequency of said control-voltage;

said inverter comprising a main thyristor for the positive buffer voltage and a main thyristor for the negative buffer voltage, energizable by said control-device and a commutation circuit including an auxiliary thyristor energizable by the control-device for each of the main thyristors;

wherein each of the individual commutation circuits are connected in parallel to at least one further commutation circuit including a further auxiliary thyristor energizable by said control-device; and

detection and selection means having an input coupled to the inverter and an output coupled to the control-device for detecting the level of a load current flowing from the inverter to said load and for controlling said control device in accordance with the detected load current such that only such a number of commutation circuits is energized as is necessary in regard of the detected load current level.

4,400,657

TRIAC FAILURE DETECTOR

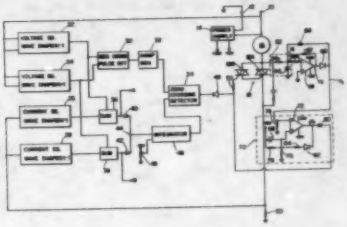
Frank J. Nola, Huntsville, Ala., assignor to The United States of America as represented by the Administrator of the National Aeronautics and Space Administration, Washington, D.C.

Filed Nov. 30, 1981, Ser. No. 325,886

Int. Cl.³ H02P *5/40*

U.S. Cl. 318—798 **20 Claims**

1. In a triac control system for controlling current flow to a load, a triac failure detection circuit for detecting a unidirectional short circuit failure of the triac control system, said failure detection circuit comprising detecting means for detecting the triac voltage waveform and for producing a first output responsive to a symmetrical triac voltage waveform produced during normal triac operation and for producing a second



output responsive to a non-symmetrical triac voltage waveform caused by failure of said triac in either a positive or negative direction; and control means, connected to said detecting means, for turning said triac full on in both directions responsive to said second output.

4,400,658

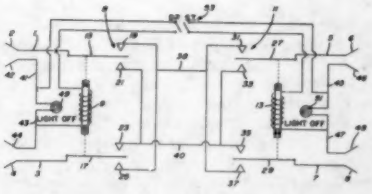
CABLE JUMPER WITHOUT POLARITY

Herbert Yates, Montreal, Canada, assignor to MYL Developments Ltd., Quebec, Canada

Filed Jun. 30, 1982, Ser. No. 393,758

Int. Cl.³ H01M *10/46*

U.S. Cl. 320—26 **7 Claims**



1. A battery cable jumper arrangement having a first pair of cables with means at the connecting ends of each cable of said first pair of cables to connect each cable end to a respective terminal of a source of D.C. power, and a second pair of cables with means at the connecting ends of each cable of said second pair of cables for connecting each said cable end to a respective terminal of a battery to be recharged;

characterized in that said arrangement includes;

first means for sensing the polarity of connection of said first pair of cables at said source of power;

second means for sensing the polarity of connection of said second pair of cables at said battery;

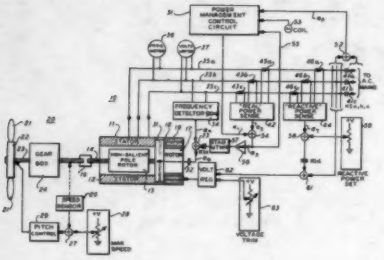
switch means driven by said first means and said second means to automatically ensure correct polarity of connection between said power source and said battery.

4,400,659

METHODS AND APPARATUS FOR MAXIMIZING AND STABILIZING ELECTRIC POWER DERIVED FROM WIND DRIVEN SOURCE

Benjamin Barron, 1335 143rd St., Whitestone, N.Y. 11357, and S. Chandrasekhara Rao, 15-47 Eberlin Dr., Fairlawn, N.J. 07410

Filed May 30, 1980, Ser. No. 154,629
Int. Cl.³ H02P 9/14, 9/30
U.S. Cl. 322—32 13 Claims



1. An apparatus for maximizing power output of an electrical generator which may be driven by a source of variable power and speed and connected to AC mains lines under control of a power management circuit; and including an AC generator connected to and driven by said source, said generator having a rotor and a stator and having output lines for being connected to said AC mains lines;

a voltage-controllable AC exciter connected to and driven by the shaft of said AC generator; and

a frequency-controllable differential frequency converter interposed between the rotor windings of said AC exciter and the rotor windings of said AC generator, the output frequency of said AC generator being proportional to the speed of said shaft plus the frequency of said frequency converter, which comprises:

means connected to said AC mains lines and to said output lines for generating a first control signal (e.g. e_1) tending to increase the power output delivered by said AC generator;

means connected to the output of said AC generator for developing a second control signal (e.g. e_2) proportional to the "real" power developed by said AC generator;

means connected to said first and second control signal generating means for generating a first error signal (e.g. e_3) proportional to the algebraic difference between said first and second control signals for input into said power management control circuit;

means connected to the output of said AC generator for developing a second error signal (e.g. e_4) proportional to the difference in frequency between said AC generator and an internal frequency reference, said frequency reference being preset to be equal to the operating frequency of the electrical utility, to which the AC generator is to be connected;

means connected to said AC exciter responsive to said first and second error signals for changing the voltage induced in the rotor windings thereof;

means for connecting the output of said AC generator to said electric utility; and

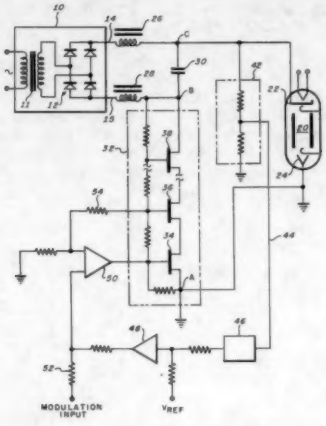
means connected to said frequency-controllable differential frequency converter and responsive to said second error signal for shifting the frequency of said frequency converter thereby to maintain said second error signal at a low value.

4,400,660

WIDE BANDWIDTH HIGH VOLTAGE REGULATOR AND MODULATOR

Martin A. Schaefer, St. Petersburg, Fla., assignor to Sperry Corporation, New York, N.Y.

Filed Sep. 23, 1981, Ser. No. 304,753
Int. Cl.³ G05F 1/44
U.S. Cl. 323—270 13 Claims



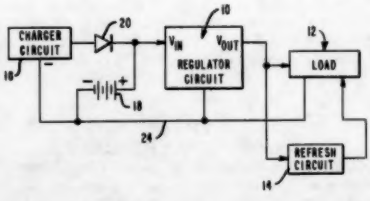
1. A circuit for controlling electrical energy delivered to a load by a high voltage source of direct energy, said source supplying a voltage and a current, wherein said circuit comprises a first leg for conductively supplying said voltage and said current to said load, a second leg for conductively returning said current to said source, means for sensing said voltage conductively disposed between said first and second legs, capacitance means disposed between said first leg and said second leg for non-resonant storing of energy from said source and for releasing energy to said load, and continuously variable impedance means coupled to said capacitance means and responsive to said sensing means for controlling said storage and release of energy.

4,400,661

VOLTAGE REGULATION AND BATTERY DISSIPATION LIMITER CIRCUIT

Raymond S. Duley, Spring Valley, Ohio, assignor to NCR Corporation, Dayton, Ohio

Filed Oct. 2, 1981, Ser. No. 308,313
Int. Cl.³ G05F 1/44
U.S. Cl. 323—275 7 Claims



1. A circuit comprising:

an input terminal;

an output terminal for connection to a load;

a positive rail connected to said input terminal;

a negative rail;

means for supplying an unregulated positive potential to said input terminal;

means for receiving a battery having its positive terminal connected to said input terminal and its negative terminal connected to said negative rail;

a first circuit portion comprising:

a first means coupled between said positive and negative rails for establishing a reference potential therebetween; and

means for determining when the potential of said battery decreases to a critical level with regard to the reference potential and also for producing a first output when the potential at said input terminal falls to said critical level and for producing a second output while the potential at said input terminal is above said critical level;

a second circuit portion coupled between said positive rail and said output terminal for regulating the output potential at said output terminal comprising:

means for determining the potential at said output terminal; and

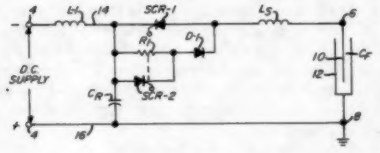
means for comparing the potential at said output terminal with said reference potential and for regulating said potential at said output terminal in accordance therewith; and

said first circuit potential also including control means for respectively enabling and disabling said second circuit portion in response to said first and second outputs so that only a small trickle current passes through said first circuit portion and no current passes through said second circuit portion in response to said second output from said control means.

4,400,662
METHOD AND APPARATUS FOR ENERGIZING AN ELECTROSTATIC PRECIPITATOR

E. Lee Coe, Jr., Downey, Calif., assignor to Wahlco, Inc., Santa Ana, Calif.

Filed Nov. 4, 1981, Ser. No. 317,793
Int. Cl.³ B03C 3/02; G05B 24/02
U.S. Cl. 323—320 **12 Claims**

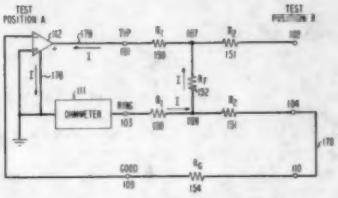


1. A control circuit comprising: a pair of spaced electrical conductors having a power input portion adapted to be connected to a direct current supply; said conductors being connected to spaced electrodes, respectively, capable of maintaining a capacitive charge therebetween; a capacitor electrically connected across said conductors in parallel with said electrodes; means electrically connected with respect to one of said conductors, for discharging said capacitor at selected spaced time intervals to produce sequential voltage pulses between said electrodes with each pulse producing a maximum voltage between said electrodes which is higher than the voltage existing across said capacitor at the initiation of the respective discharge thereof, for determining the duration of each of said pulses, and for effectively electrically isolating said capacitor from said input portion throughout the duration of each of said pulses; said means being electrically effective to discharge said capacitor only throughout that portion of each of said pulses during which the voltage between said electrodes is increasing; additional means electrically connected with respect to said one conductor and said capacitor for sequentially recharging said capacitor by the charge existing between said electrodes after each of said pulses has achieved said maximum voltage; and said additional means including an electrical impedance to maintain the voltage between said electrodes at the conclusion of each of said pulses at a voltage of a different magnitude than the voltage existing between said electrodes at the initiation of the respective ones of said pulses with said magnitude always increasing in the same manner until a selected voltage exists between said electrodes.

4,400,663
SHUNT FAULT TESTER FOR MULTICONDUCTOR CABLE

Paul H. May, Whippany, N.J., assignor to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed Oct. 28, 1981, Ser. No. 315,665
Int. Cl.³ G01R 31/08; H04B 3/46
U.S. Cl. 324—52 **9 Claims**



5. Apparatus (FIG. 5) to test a wire pair (TIP, RING) from a multiconductor cable having a shield (SHIELD) and at least one other conductor (GOOD) paralleling said pair for a resistive shunt fault (R_F) located between first (A) and second (B) test positions and for determining the resistance (R_1) of one wire (RING) between said fault and said first test position, said apparatus

CHARACTERIZED BY:

means at said first position comprising:

operational amplifier means (112) having its noninverting (+) input connected to its common (176), its inverting (−) input connected to said other conductor (109), and its output connected to the other wire (101) of said pair, and

an ohmmeter (111) connected between said one wire (103) and said common, and

means at said second position for shorting said one wire (104) to said conductor (110),

wherein the reading of said ohmmeter is indicative of said resistance.

4,400,664
DIGITAL PHASE DETECTOR

Phillip M. Moore, Phoenix, Ariz., assignor to Motorola, Inc., Schaumburg, Ill.

Filed May 26, 1981, Ser. No. 267,155
Int. Cl.³ G01R 25/00
U.S. Cl. 324—83 D **5 Claims**

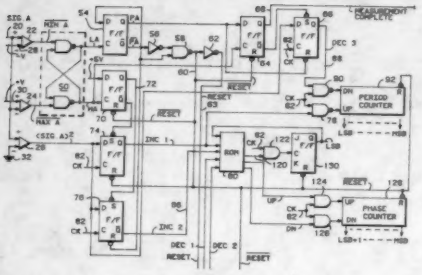
1. An improved method for measuring a phase angle relationship of a first and a second noisy signals having the same period, each signal having a spectrum comprising only odd harmonics of a sine wave having the same period, each signal having a finite shape at each zero crossing time wherein said noisy signals may have a direct current bias voltage thereon, comprising the steps of:

amplifying and limiting the first and second noisy signals to provide first and second bilevel signals, respectively, said bilevel signals being noisy in the time vicinity of the zero crossing times;

generating clock pulses of a predetermined repetition rate;

enabling a first count of said clock pulses during a time between a first zero crossing time of the first noisy signal and a first subsequent zero crossing time of said second noisy signal;

enabling a second count of said clock pulses during a time between a second sequential zero crossing time of the first noisy signal and a second subsequent zero crossing time of said second noisy signal;



enabling a third count of the period of one of the noisy signals; and

outputting said first, second and third counts and a signal signifying completion of said counts.

4,400,665

DEVICE FOR AUTOMATICALLY MEASURING THICKNESS OF COATINGS ON A SUBSTRATE BY COMPARISON WITH AN UNCOATED SUBSTRATE

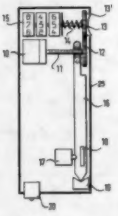
Maria Nix, born Saxler, Cologne, Fed. Rep. of Germany, assignor to Norbert Nix, Fed. Rep. of Germany

Filed Dec. 19, 1979, Ser. No. 105,223

Claims priority, application Fed. Rep. of Germany, Dec. 23, 1978, 2855912

Int. Cl.³ G01B *7/10*; G01R *33/12*

U.S. Cl. 324—230 **11 Claims**



1. A portable instrument for measuring the thicknesses of coatings on substrates based on a spacing-dependent, electromagnetic characteristic of the substrate, comprising a housing enclosing:

a measuring probe for resting against the coating and interacting with the substrate to measure the characteristic,

a comparison body with the same electromagnetic characteristic as the substrate,

a compensating probe for interacting with the comparison body to measure the characteristic of the comparison body,

means for adjusting the spacing of the compensating probe from the comparison body until the same electromagnetic interaction is obtained as between the measuring probe and the substrate, and

means for displaying the spacing between the compensating probe and comparison body, said means for adjusting including an automatic control circuit for adjusting the spacing between the comparison body and the compensating probe, and electric drive means operated by said automatic control circuit for displacing the comparison body, said means for displaying being operatively coupled to said electric drive means.

4,400,666

FIXED RATE DELAY CIRCUIT

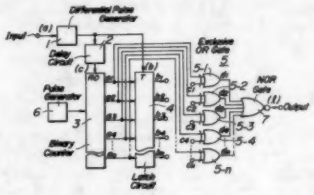
Takuji Sekiguchi, Machida, Japan, assignor to Nippon Hoso Kyokai, Tokyo, Japan

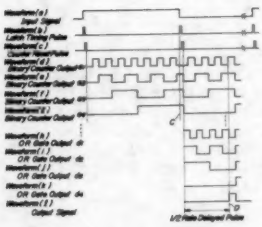
Filed Jan. 23, 1981, Ser. No. 227,740

Claims priority, application Japan, Jan. 29, 1980, 55-8349

Int. Cl.³ H03K *5/135*

U.S. Cl. 328—130.1 **7 Claims**





1. A fixed rate delay circuit, wherein an input pulse sequence having time varied pulse intervals is delayed sequentially at a fixed rate of one divided by an integer'th power of 2 of an immediately preceding pulse interval in order, comprising

a binary counter for counting clock-pulses having a predetermined repetition interval every time prior to a reset signal applied thereto,

a latch circuit for latching respectively every digit of a binary number of the clock-pulses counted by said binary counter in response to the input of a latch signal just preceding said reset signal,

a timing pulse generator for generating said latch signal which consists of differential pulses corresponding respectively to each pulse of said input pulse sequence and for forming said reset signal by delaying said differential pulse by a time duration being shorter than the repetition interval of said clock-pulses,

a plurality of exclusive OR gates, to respective first inputs of which every digit of said binary number of the clock-pulses counted by said binary counter is applied in order and to respective second inputs of which every digit of said binary number which is latched by said latch circuit is applied in order after being shifted down respectively by integral digits for deriving respective OR output signals when said every digit applied to the respective first inputs and every shifted down digit applied to the respective second inputs coincide with each other in order, and

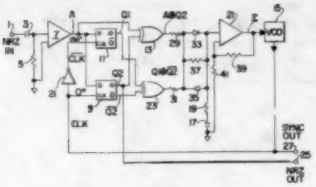
a NOR gate, to which the respective OR output signals of said plurality of exclusive OR gates are applied, for deriving said input pulse sequence after being delayed at said fixed rate.

4,400,667

PHASE TOLERANT BIT SYNCHRONIZER FOR DIGITAL SIGNALS

Martin Belkin, Sarasota, Fla., assignor to Sangamo Weston, Inc., Norcross, Ga.

Filed Jan. 12, 1981, Ser. No. 224,421
Int. Cl.³ H03B 3/04
U.S. Cl. 331—1 A 16 Claims



8. Apparatus for generating a clock signal synchronous with the bit rate of a received data signal comprising:

phase-looked loop means including a loop filter, a loop amplifier, and a voltage controlled oscillator, said oscillator generating a first clock signal whose frequency varies as a function of a net control voltage applied thereto;

means for generating a second clock signal shifted by 180° from said first clock signal;

first and second register means, each having inputs responsive to said received data signal and inputs responsive respectively to said first and second clock signals, each register outputting first and second signals representative of said received data signal and the logical complement of said received data signal, the output signals of said second register means being shifted by one-half bit period from the output signals of said first register means;

first and second phase error detecting means, said first phase error detecting means having an input responsive to said first output signal of said second register means and to said complementary signal output of said first register means whereby said first phase error detecting means produces an output signal having a fixed width of one-half bit period, said second phase error detecting means having an input responsive to said received data signal and to said first signal output of said first register means, whereby said second phase error detecting means produces an output signal complementary to said fixed width output signal and having a width proportional to the phase difference between said received data signal and said first clock signal; and

means for summing said output signals of said phase error detecting means to generate a net control voltage which is applied to said phase-looked loop means, whereby the frequency and phase of said first clock signal is synchronized with that of said received data signal.

4,400,668

PERIOD PROPORTIONAL TWO-PHASE VOLTAGE CONTROLLED OSCILLATOR

Dale M. Uetrecht, Colerain Township, Hamilton County, Ohio, assignor to Baldwin Piano & Organ Company, Cincinnati, Ohio

Division of Ser. No. 162,631, Jun. 24, 1980, Pat. No. 4,343,219.
This application Jun. 19, 1981, Ser. No. 275,356
Int. Cl.³ H03K 3/28
U.S. Cl. 331—45 3 Claims

1. A period-proportional voltage-controlled oscillator apparatus comprising:

a transistor;

bias means connected to a first source of operating potential for biasing the emitter of said transistor;

means for connecting the emitter of said transistor to a source of time varying modulation control voltage;

capacitive means connected between the base of said transistor and the collector of said transistor;

first impedance means connecting the base of said transistor to a second source of operating potential;

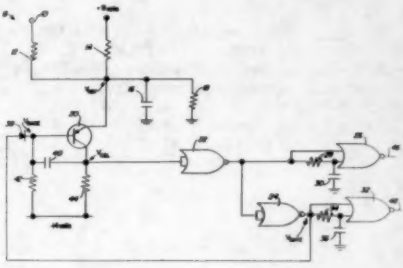
second impedance means connecting the collector of said transistor to the second source of operating potential;

first inverter means having its input connected to the collector of said transistor for providing a first output signal;

second inverter means having its input connected to the output of said first inverter means for providing a second output signal; and

diode means connecting the output of said second inverter means to the base of said transistor;

whereby when the output of said second inverter means is in a first state, said diode is forward biased and said transistor is in the off state thereby causing said capacitive means to



discharge through said second impedance means and the voltage level at the collector of said transistor to decrease until the threshold voltage of said first inverter means is reached, at which time the output of said first inverter means switches from a second state to the first state thereby causing the output of said second inverter means to switch from the first state to the second state, thereby in turn reverse biasing said diode and causing said transistor to switch to the on state, thereby further causing said capacitive means to charge through said first impedance means until the threshold voltage of said first inverter means is reached, at which time the output of said first inverter means again switches states and the cycle is repeated, and whereby the period of said first and second output signals is directly proportional to the amplitude of the modulation control voltage.

4,400,669

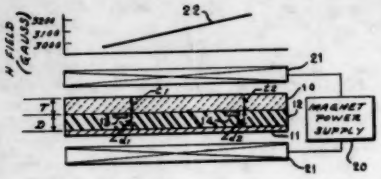
MAGNETOSTATIC WAVE DELAY LINE HAVING IMPROVED GROUP DELAY LINEARITY

Michael R. Daniel, Monroeville; John D. Adam, Murrysville, both of Pa., and Robert A. Moore, Arnold, Md., assignors to The United States of America as represented by the Secretary of the Air Force, Washington, D.C.

Filed Sep. 25, 1981, Ser. No. 305,667
Int. Cl.³ H03H 9/30, 9/125
U.S. Cl. 333—141 8 Claims

1. In a magnetostatic wave delay line having a ground plane member, a magnetostatic substrate member in spaced proximate relationship thereto, transmitting and receiving transducers spaced apart and operably engaged to said substrate member and means for generating a magnetic bias field, the improvement residing in a delay line parameters configuration of discrete parameters for group delay linearity enhancement, said delay line parameters configuration comprising

linear parameter variation with distance, between said transmitting and receiving transducers, said linear parameter



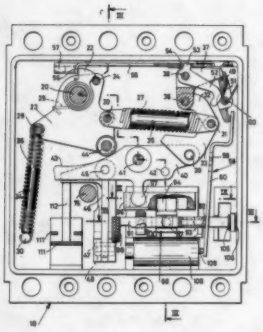
variation being implemented by means of a linear variation of the magnetic field bias strength.

4,400,670

ELECTRIC SWITCH, MORE PARTICULARLY A CURRENT-LIMITER

Angelo Mostosi, Bergamo, Italy, assignor to SACE S.p.A. Costruzioni Elettromeccaniche, Bergamo, Italy

Filed Mar. 31, 1982, Ser. No. 363,929
Claims priority, application Italy, Apr. 2, 1981, 20900 A/81
Int. Cl.³ H01H *77/06*
U.S. Cl. 335—6 **13 Claims**



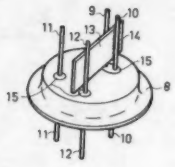
1. An electric switch, more particularly a current limiter, having fixed and movable contacts and a control mechanism actuated by a control pin mounted for rotation in the switch casing, characterized in that said control pin carries for free rotation about its axis a rocking assembly, which is coupled with the control pin under the bias of first resilient means in a direction of rotation of said pin, and can be cleared of the pin against the bias of said first resilient means, in the opposite direction of rotation of the pin, in that there are provided two extension springs, with means to limit their maximum compression and attached at either end to the rocking assembly so as to tend to have it rotated in opposite directions, the free end of one of said spring being attached to the switch casing and that of the second spring to the linking pin of two toggle connecting rods, one of which is pivoted to an arm of a rocker and the other to an arm of a bell crank lever, said rocker and said bell crank lever being rotatable about axes, parallel to the axis of the control pin, in that said rocker carries a stop for the connecting rod pivoted thereto and carries pivoted to its other arm a control member for the moving contacts, said other arm of the rocker having a cammed profile with which a follower is intended to coact, as carried by said rocking assembly, in that a lever is provided which is rotatable about an axis parallel to the axis of the control pin under the bias of second resilient means to provide a resting surface to the second arm of said bell crank lever, and in that means are provided to rotate said lever against the bias of the second resilient means for withdrawing the rest surface to said second arm of the bell crank lever.

4,400,671

MAGNETICALLY CONTROLLED MERCURY WETTED SWITCH AND ELECTRICAL RELAY INCORPORATING SUCH A SWITCH

Jacques Legrand, Paris, France, assignor to Thomson-CSF, Paris, France

Filed Jan. 6, 1981, Ser. No. 222,887
Claims priority, application France, Jan. 8, 1980, 80 00308
Int. Cl.³ H01H *29/00*
U.S. Cl. 335—56 **9 Claims**



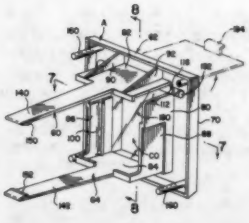
1. A switch comprising: a base having a planar surface, a cover placed over said planar surface so as to define therewith a closed space, a plurality of electrodes of ferro-magnetic material passing through said base and surface into said space, electrically insulating glass/metal welds surrounding said electrodes in said base to seal said electrodes with respect thereto, the planar surface of said base and the interior surface of said cover and the surfaces of said electrodes inside said space being wetted by an electrically conducting liquid, said welds being the only surfaces of said space not wetted by said liquid, one of said plurality of electrodes forming a common contact, at least one elongated plate of ferro-magnetic material arranged in said space and extending substantially perpendicular to said planar surface of said base, said plate being movable about a liquid hinge formed by capillarity by the conductive liquid wetting the common electrode and plate surface, said plate being adapted to bear against said at least one other electrode and to be held thereagainst by surface tension so that electrical current may pass from said common electrode to said at least one other electrode.

4,400,672

RELAY MOUNTING DEVICE

Thomas J. Bottelson, Baraboo, Wis., assignor to Gulf & Western Manufacturing Company, Southfield, Mich.

Filed Aug. 27, 1981, Ser. No. 296,981
Int. Cl.³ H01H *45/04*
U.S. Cl. 335—202 **19 Claims**



1. A relay mounting device for securing a relay having a front face with visual or manipulative components onto a support panel having a front surface, a parallel rear surface and an access opening through the panel for receiving said mount-

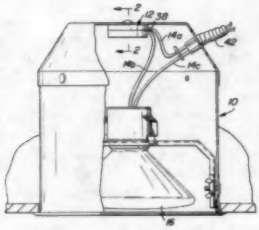
ing device, said device comprising: a unitary plastic body having a bezel portion overlying and engaging said front surface of said panel around said access opening and defining a central opening, a relay supporting cradle depending from said bezel portion and extending through said access opening in a direction from said front surface to said rear surface with said bezel and cradle leaving said access opening substantially unobstructed, said cradle defining a relay receiving nest, and fastening means on said bezel and extending through portions of said panel bordering the access opening therein and fixedly securing said body onto said panel with said central opening exposing, through said unobstructed access opening, said relay receiving nest at said front surface; said supporting cradle including a first abutment means adjacent said bezel, a second abutment means spaced away from said bezel, said first and second abutment means generally defining said relay receiving nest, and means for holding said relay in said nest between said first and second abutment means with said front face exposed through said panel by said unobstructed central opening.

4,400,673

THERMAL SWITCH HOUSING

Lester J. Gilman, Southampton, Pa., assignor to Kiddo Consumer Durables Corporation, Bala Cynwyd, Pa.

Filed Dec. 21, 1981, Ser. No. 333,225
Int. Cl.³ H01H *37/04*
U.S. Cl. 337—380 **16 Claims**



1. An apparatus for interchangeably accommodating a thermal switch comprising:

(a) a housing;

(b) a channel disposed within said housing adapted to accommodate a thermal switch having an open or closed status, wherein said channel extends through a side of said housing to define a first access opening;

(c) a pair of electrical contacts disposed within said housing and arranged along said channel to provide an electrical connection between said electrical contacts and terminals of said thermal switch; and

(d) means for conductively connecting a pair of external electrical conductors to said electrical contacts wherein said thermal switch is interchangeably insertable through said first access opening into said channel such that an electrical path is established through said external electrical conductors when said thermal switch has been inserted and is in said closed status.

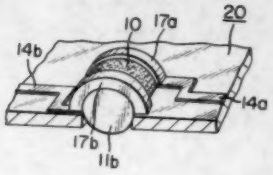
4,400,674

COIL UNIT

Takayuki Suda, Kisakata, and Koichi Yasuda, Nishime, both of Japan, assignors to TDK Electronics Co., Ltd., Tokyo, Japan

Filed Sep. 9, 1980, Ser. No. 185,526
Claims priority, application Japan, Apr. 22, 1980, 55-53925
Int. Cl.³ H01F *15/02, 15/10*
U.S. Cl. 336—65 **7 Claims**

1. A coil unit comprising an outer core in the form of about a half cylinder, and a drum-shaped bobbin core provided with a flange on each end thereof and having a coil wound thereon, said outer core and said bobbin core being assembled with a part of the outer periphery of said flanges fixed to the inner periphery of said outer core and with the outer core encasing



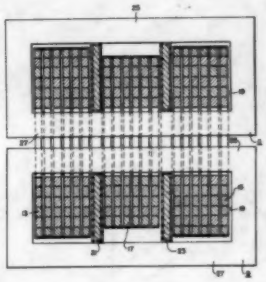
the bobbin core for only about one-half the circumference of said bobbin core, the remainder of said bobbin core being non-encased.

4,400,675

TRANSFORMER WITH IMPEDANCE MATCHING MEANS

Michael W. Thomas, Marshall Township, Allegheny County, Pa., assignor to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Nov. 5, 1981, Ser. No. 318,508
Int. Cl.³ H01F *17/06, 27/24*
U.S. Cl. 336—160 **8 Claims**



1. An electrical power transformer comprising:

a core member;

groups of sectioned low voltage windings and of high voltage windings which windings are inductively related to the core member;

a shunt of magnetic material between each group of low voltage windings and the high voltage windings; and

each shunt comprising microlaminations of magnetic materials.

4,400,676

ELECTRICALLY INSULATED COIL

Hisayasu Mitsui, Yokohama, Japan, assignor to Tokyo Shibaura Denki Kabushiki Kaisha, Kawasaki, Japan

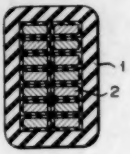
Filed Dec. 2, 1980, Ser. No. 212,157
Claims priority, application Japan, Dec. 7, 1979, 54/158056
Int. Cl.³ H01F *27/32;* B32B *19/00, 27/38*
U.S. Cl. 336—205 **4 Claims**

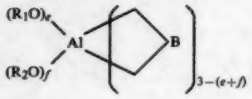
1. An electrically insulated coil comprising:

a coil; and

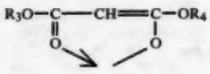
a mica tape containing a resin composition wound about said coil;

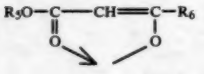
said resin composition comprising an epoxy resin, an aluminum complex curing catalyst having the formula:



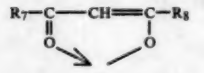


wherein R_1 and R_2 independently are each an alkyl group, e and f are 0, 1, 2 or 3 with the total of e+f not exceeding 3 and wherein B is a ligand selected from the group consisting of:

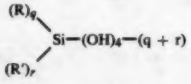




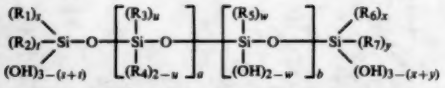
and



wherein groups R_3–R_8 independently of one another are alkyl, and a silane compound curing accelerator of the formula:



wherein R and R′ independently of one another are alkyl, phenyl, aralkyl, vinyl or allyl, q and r are 0, 1, 2 or 3 with the sum of q and r not exceeding 3 or a polysiloxane curing accelerator of the formula:



wherein groups R_1–R_7 independently of each other are a monovalent organosiloxane group optionally substituted by alkyl, phenyl, vinyl, aralkyl, allyl or hydroxyl; each of s, t, x and y, being 0, 1 or 2 with the sum of s+t and the sum of x+y each not exceeding 2, u and w each being 0, 1 or 2 and a and b each being 0 or an integer of 1 or more, said curing catalyst being present in said composition in an amount of 0.1 to 5% by weight based on the epoxy resin, and said curing accelerator being present in said composition in an amount of 0.1 to 10% by weight based on said epoxy resin; and

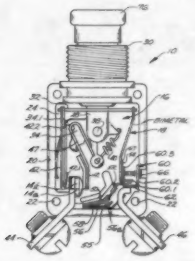
curing said composition by heating the same after said mica tape is wound around said coil.

4,400,677

FAIL SAFE CIRCUIT BREAKER

Carleton M. Cobb, III, East Walpole, Mass.; Roland G. Morin, Central Falls, R.I., and Hans G. Hirsbrunner, Attleboro, Mass., assignors to Texas Instruments Incorporated, Dallas, Tex.

Filed Dec. 9, 1981, Ser. No. 328,974
Int. Cl.³ H01H *71/16, 85/08*
U.S. Cl. 337—6 **5 Claims**



1. A circuit breaker comprising movable contact means, complementary contact means, a mechanism for holding the movable contact means in engagement with the complementary contact means to close an electrical circuit, the mechanism including thermally responsive bimetallic means of relatively high resistance properties disposed in the circuit to generate heat and be self-heated within a first selected period of time in response to the flow of a selected overload current in the circuit through the bimetallic means to trip the mechanism to move the movable contacts to open the circuit, and thermally separable means in the circuit for alternately opening the breaker circuit, characterized in that, said thermally separable means comprises conductor means joined by a thermally separable bond and disposed in the circuit in a heat-transfer relation to the bimetallic means selected so that the conductor means are thermally separated after a second period of time by heat generated in the bimetallic means and transferred to the conductor means from the bimetallic means when said selected overload current flows in the circuit to open the circuit after said second period of time in the event that heating of the bimetallic means is ineffective to move the movable contact means to open the circuit after said first period of time.

4,400,678

FUSE SWITCH BOX

Chang C. Chen, and Chei P. Chan, both of 7, Lane 12, Tsuey Hwa St., Pan Chiao Shih, Taipei Hsien, Taiwan

Filed Apr. 29, 1981, Ser. No. 258,812
Int. Cl.³ H01H *85/22*
U.S. Cl. 337—195 **4 Claims**

1. A fuse switch box with means to replace a fuse contained in a fuse tube comprising

a mounting unit,

a tripper in the form of a door pivotally mounted on said mounting unit and including on its interior

a pair of grooved pieces to accommodate cross-over linkage of a fuse tube,

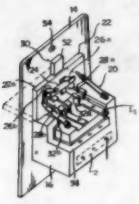
a jutting foot extending from each of said grooved pieces,

sockets connected respectively to power input and power output leads and located to receive and couple to each of said jutting feet forming a closed electrical circuit when said tripper is in a closed position parallel to said mounting unit,

compression spring mechanism biased against said tripper

to bias it in an open position to detach said jutting feet from said sockets and thereby open the electrical circuit of the fuse,

latching means to hold said tripper in the closed position against the bias of said compression spring mechanism



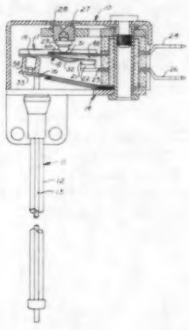
whereby upon release of said latching means said tripper springs to an open position and quickly disconnects the electrical circuit including separating said jutting feet from said sockets.

4,400,679

SNAP ACTING SWITCH FOR THERMOSTATS

Harold F. Snider, Mansfield, Ohio, assignor to Therm-O-Disc, Incorporated, Mansfield, Ohio

Filed Sep. 21, 1981, Ser. No. 304,016
Int. Cl.³ H01H *37/46*
U.S. Cl. 337—382 **16 Claims**



1. A condition-sensing switching device comprising a body, a fixed contact, a movable contact, a bistable movable contact support assembly mounted on said body and supporting said movable contact for movement into and out of engagement with said fixed contact with snap action, said contact support assembly providing a first substantially rigid, elongated arm connected at one end to said body by pivot means, a second elongated arm connected at one end to said first arm substantially adjacent to the other end of said first arm, said movable contact being mounted on the other end of said second arm, spring means placing said first arm in axial compression and said second arm in axial tension and operating to produce an unstable condition when the connection between said arms is in a predetermined location, and condition-responsive means operably connected to cause movement of said connection between said arms through said predetermined position and causing said contacts to open and close with snap action, said connection between said arms being structured to prevent bending of said first arm under normal loading thereof whereby said first arm functions as a rigid beam pivoted at one end, said arms being structured so that the planes thereof intersect with a small angle so that relatively small forces applied to said connection between said arms produce substantial shear forces between said contacts to break welds which occur therebetween.

4,400,680

OVERTEMPERATURE DETECTION CABLE

Ture A. Heline, Jr., Brookline, N.H., assignor to Armtec Industries, Inc., Manchester, N.H.

Filed Feb. 4, 1980, Ser. No. 118,753
Int. Cl.³ H01H *37/76*
U.S. Cl. 337—415 **4 Claims**

1. An overtemperature detection cable for completing an electrical circuit responsive to being heated above a predetermined temperature, said cable comprising:

an electrically conductive, substantially rigid outer sheath of generally sinusoidal configuration and having an interior wall;

an inner spring wire electrical conductor disposed within said outer sheath in a generally sinusoidal configuration and spaced from said interior sheath wall to be in substantial coaxial relation with said outer sheath;

said inner spring wire conductor being self-biased to assume a generally straight configuration and for movement toward said interior sheath wall; and

a thermoplastic dielectric material surrounding said inner spring wire conductor within said sheath for maintaining said inner spring wire conductor indefinitely in a sinusoidal configuration out of contact with said interior sheath wall and for electrically insulating said inner spring wire conductor from said outer sheath,

said thermoplastic dielectric material having a predetermined melting temperature and softening responsive to being heated above said predetermined melting temperature through said outer sheath to allow said inner spring wire conductor to assume said approximately straight configuration and move into localized electrical contact with said interior sheath wall.

4,400,681

SEMICONDUCTOR PRESSURE SENSOR WITH SLANTED RESISTORS

Ronald E. Brown; Lamonte R. Edison, both of Kokomo, and William D. Higdon, Greentown, all of Ind., assignors to General Motors Corporation, Detroit, Mich.

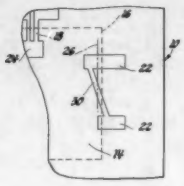
Filed Feb. 23, 1981, Ser. No. 237,474
Int. Cl.³ G01L *1/22*
U.S. Cl. 338—4 **7 Claims**

1. A pressure sensing element comprising

a semiconductor chip containing a cavity defining a diaphragm subject to deflection in response to pressure, the diaphragm having an elongated high strain zone adjacent and parallel to the diaphragm edge wherein upon diaphragm deflection a localized high strain peak is produced in the high strain zone, and

a plurality of piezoresistive resistors in the chip for sensing strain in the diaphragm, at least one of said resistors for measuring the strain in the strain zone, said one resistor being elongated and slanted across the high strain zone with the longitudinal resistor axis disposed at an angle in

the approximate range of 10° to 20° with respect to the said zone, so that small variations in resistor placement



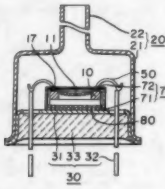
relative to the strain zone result in only minor variations in resistor response to diaphragm strain.

4,400,682

PRESSURE SENSOR

Kiyoshi Ishibashi, Itami, Japan, assignor to Mitsubishi Denki Kabushiki Kaisha, Toyko, Japan

Filed Nov. 6, 1981, Ser. No. 319,060
Claims priority, application Japan, Nov. 10, 1980, 55/159071
Int. Cl.³ G01L *1/22*
U.S. Cl. 338—4 **2 Claims**



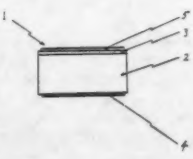
1. A pressure sensor comprising: a pressure sensor chip including a diaphragm, a stationary support supporting said diaphragm, and a bed supporting said stationary support, said diaphragm, said stationary support and said bed being made of a semiconductor material and defining a space which is evacuated; a holding box having at least its bottom made of metal and having a hole for internal wiring, said holding box accommodating and holding said pressure sensor chip such that the opposite side to the diaphragm of said pressure sensor chip is in contact with the inner side of said bottom and that said pressure sensor chip is restricted from movement; and a package placing and adhering said holding box in position.

4,400,683

VOLTAGE-DEPENDENT RESISTOR

Kazuo Eda, Hirakata; Masanori Inada, Nara, and Michio Matsuoka, Ibaraki, all of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Japan

Filed Sep. 18, 1981, Ser. No. 303,613
Int. Cl.³ H01C *7/10*
U.S. Cl. 338—21 **5 Claims**



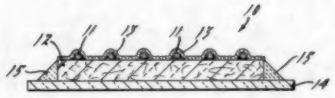
1. A voltage-dependent resistor of layered structure type, comprising at least one zinc oxide (ZnO) layer adjacent to at least one metal oxide layer consisting of 99.9～60 mole percent of bismuth oxide (Bi_2O_3) and at least one of the members selected from the group consisting of 0.1～40 mole percent of cobalt oxide (Co_2O_3), 0.1～40 mole percent of manganese oxide (MnO_2), 0.1～3.0 mole percent of antimony oxide (Sb_2O_3) and 0.1～17 mole percent of zinc oxide (ZnO) with electrodes applied to opposite surfaces.

4,400,684

FAST RESPONSE TEMPERATURE SENSOR

Toshimoto Kushida, Dearborn, and William A. Fate, Ann Arbor, both of Mich., assignors to Ford Motor Company, Dearborn, Mich.

Filed Aug. 31, 1981, Ser. No. 297,679
Int. Cl.³ H01C *3/04*
U.S. Cl. 338—25 **7 Claims**



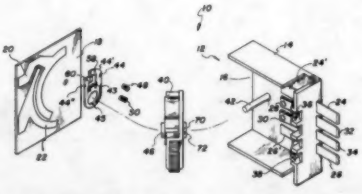
1. A fast response temperature sensor assembly including:
a support substrate having a low thermal conductivity, a low heat capacity, and a low density, said support substrate being a glass foam material having a density of about 0.112 grams per cubic centimeter and thermal conductivity of less than 5.5×10^2 watt per centimeter degree giving a leakage of about 3.08×10^{-5} watt^2 sec/cm^{4}deg^2;
a fast response temperature sensor; and
coupling means for securing said temperature sensor to said support substrate thereby strengthening the mechanical integrity of said fast response temperature sensor assembly.

4,400,685

CONTROL SYSTEM

Benjamin F. Chestnut, Indianapolis, Ind., assignor to Emhart Industries, Inc., Indianapolis, Ind.

Filed Sep. 21, 1981, Ser. No. 303,878
Int. Cl.³ H01C *10/36*
U.S. Cl. 338—172 **6 Claims**



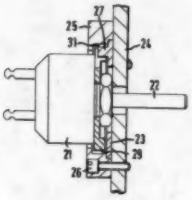
1. A combination of a switch and variable resistor comprising:
(a) a housing,
(b) at least four electrical terminals carried by said housing,
(c) a resistance path and a collector path carried by said housing and individually electrically connected to two of said four electrical terminals,
(d) a rotating member rotatably carried in said housing,
(e) an electrical contact arm carried by said rotating member,
(f) spring means carried by said rotating member and engaging said electrical contact arm to bias same against said resistance and collector paths, and
(g) an electrically conductive path carried by said rotating member selectively engaging another two terminals of said four terminals to provide said switch.

4,400,686

VARIABLE ELECTRICAL RESISTANCE DEVICE

Arnold Pitcher, Romford, England, assignor to Colvern Limited, Essex, England

Filed Jul. 21, 1981, Ser. No. 285,693
Int. Cl.³ H01C 1/02
U.S. Cl. 338—184 15 Claims



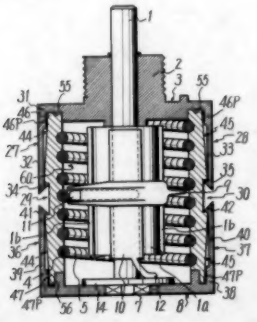
1. A rotary variable electrical resistance device comprising: a housing; a spindle secured in and arranged for rotation in said housing and adapted to adjust the setting of said device by causing a wiper of electrically conductive material to traverse an electrical resistance element supported by said housing, said spindle being adapted to be substantially rigidly secured to the end of a rotatably supported shaft, on a common axis with said shaft, whereby said spindle is rotatable with said shaft and such that said shaft substantially supports said device; means cooperating between said housing and a support to restrain said housing from rotation about the axis of said spindle when said spindle is caused to be rotated by said shaft, said means also being arranged such that said device is displaceable with respect to said support to follow longitudinal and/or lateral displacement of said end of said shaft when said shaft is rotated.

4,400,687

HOUSING FOR USE WITH A VARIABLE RESISTOR

Eitaro Shimoda, and Kiyoshi Yamashita, both of Yokohama, Japan, assignors to Sakae Tsushin Kogyo Co. Ltd., Japan

Filed Sep. 21, 1981, Ser. No. 304,039
Claims priority, application Japan, Oct. 14, 1980, 55-145836[U]
Int. Cl.³ H01C 1/02, 10/00
U.S. Cl. 338—184 7 Claims



1. A housing for use with a variable resistor consisting of a resistance element, a rotary shaft, a conductive slide plate and a top, said housing comprising:

(a) a cylindrical body for supporting on its inner surface said resistance element, said cylindrical body having on its outer surface grooves elongated along its lengthwise direction;

(b) a first cylindrical panel engaged with one open end of said cylindrical body to close the open end and rotatably supporting said rotary shaft;

(c) a second cylindrical panel engaged with the other open end of said cylindrical body and rotatably supporting said rotary shaft;

(d) at least one pair of resilient engaging projections extended from at least one of said first and second cylindrical panels along the axis of said cylindrical body, each of said pair of resilient engaging portions being formed as a plate-like shape and being guided by said grooves; and

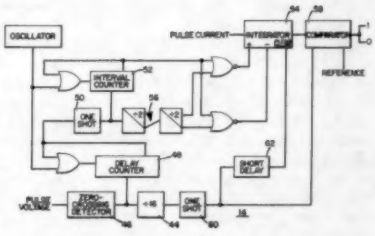
(e) engaging recesses formed on an outer periphery of said cylindrical body at predetermined positions and respectively engaging with said resilient engaging projections when said first and second cylindrical panels are engaged with said cylindrical body to make up said housing for the variable resistor.

4,400,688

METHOD AND APPARATUS FOR COMMUNICATION OVER ELECTRIC POWER LINES

Reed H. Johnston, Wellesley; Dennis C. Jeffreys, Bedford; Lawrence J. Stratton, Lexington, and Albert W. Welz, Jr., Westford, all of Mass., assignors to New England Power Service Company, Westborough, Mass.

Continuation of Ser. No. 64,139, Aug. 6, 1979, abandoned, which is a continuation of Ser. No. 649,843, Jan. 16, 1976, abandoned.
This application Oct. 15, 1980, Ser. No. 197,043
Int. Cl.³ H04B 3/54
U.S. Cl. 340—310 R 19 Claims



1. A method of transmitting intelligence in a direction from load to source over an electric power line having a voltage wave thereon and supplying current to at least one load, said method comprising the steps of:

(1) adding to the load current on the line recognizable pattern of signaling currents in synchronism with the power line voltage wave, said pattern of signaling currents representing at least a portion of the intelligence to be transmitted;

(2) sensing the line current comprising the combined load and signaling currents on the line and generating in response thereto a corresponding pattern of signals having a characteristic which is a function of the sensed line current; and,

(3) extracting the transmitted intelligence from the sensed line current by processing said corresponding pattern of signals in accordance with an algorithm which commences in synchronism with the pattern of signaling currents and which operates on the sensed line current in opposite senses at different positions along the voltage wave with the sense at any one of said positions being determined by the synchronism and with each element of intelligence in the pattern of signaling currents being inferred from the polarity of the signal resulting from said processing.

4,400,689

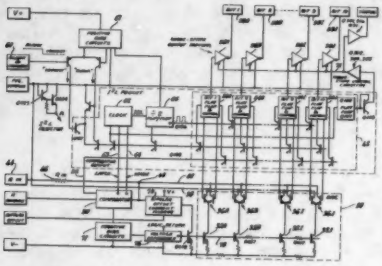
A-TO-D CONVERTER OF THE SUCCESSIVE-APPROXIMATION TYPE

Adrian P. Brokaw, Burlington, and Modesto A. Maidique, Lexington, both of Mass., assignors to Analog Devices, Incorporated, Norwood, Mass.

Continuation-in-part of Ser. No. 785,322, Apr. 7, 1977, abandoned. This application Aug. 8, 1978, Ser. No. 931,960

Int. Cl.³ H03K *13/02, 13/08*

U.S. Cl. 340—347 AD **2 Claims**



1. An analog-to-digital converter comprising a single monolithic chip formed with:

a plurality of normal mode transistor current sources arranged to produce respective currents for summation into a composite signal;

I^2L inverted mode transistor means including logic circuit means defining successive-approximation control means arranged to carry out a successive-approximation algorithm;

switch means comprising a series of individual switch circuits in the form of normal-mode transistors serving to selectively control the outputs of said current sources;

said I^2L inverted mode transistor means including clock means for supplying clock pulses to said logic circuit means to carry out said successive-approximation algorithm;

said successive-approximation control means comprising a series of register stages which are activated in sequence as the algorithm proceeds;

said register stages comprising I^2L inverted mode transistors arranged as flip-flops;

means connecting each of said individual switch circuits to a collector of one of said flip-flops without the interposition of level translators therebetween;

the switch circuits being operable in sequence by the collector currents and connected to a corresponding current source to cause current from its source to be supplied to a summing point, whereby the combination of selected currents develops at said summing point said composite signal for comparison with an analog input signal.

4,400,690

A-TO-D CONVERTER OF THE SUCCESSIVE-APPROXIMATION TYPE

Adrian P. Brokaw, Burlington, and Modesto A. Maidique, Lexington, both of Mass., assignors to Analog Devices, Incorporated, Norwood, Mass.

Division of Ser. No. 931,960, Aug. 8, 1978, which is a continuation-in-part of Ser. No. 785,322, Apr. 7, 1977, abandoned. This application Aug. 20, 1979, Ser. No. 67,992

Int. Cl.³ H03K *13/02, 13/08*

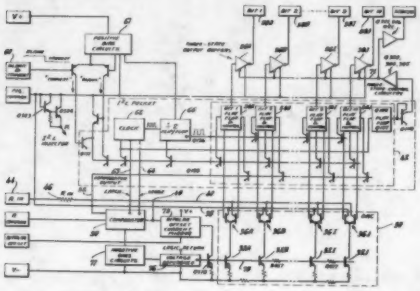
U.S. Cl. 340—347 AD **19 Claims**

1. An integrated circuit analog-to-digital converter wherein an analog input signal is compared to an internally derived signal comprising:

internal signal-deriving means including normal mode transistors connected in said converter so as to be negative with respect to ground;

digital control means including inverted-mode transistors for controlling said signal-deriving means;

biasing means for said digital control means arranged to provide that said digital control means is negative with respect to ground;



means providing a signal which is positive with respect to ground for controlling the operation of said digital control means; and

circuit means establishing direct interconnection between said digital control means and said signal-deriving means without the interposition of level translators therebetween.

4,400,691

ANALOG-TO-DIGITAL CONVERTER FOR CAMERAS

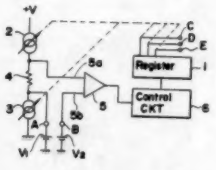
Shuji Izumi, Sakai; Masayoshi Sahara, Sennan, and Masaaki Nakai, Nara, all of Japan, assignors to Minolta Camera Kabushiki Kaisha, Osaka, Japan

Filed Aug. 3, 1981, Ser. No. 289,375

Claims priority, application Japan, Sep. 1, 1980, 55-121667

Int. Cl.³ H03K *13/02*

U.S. Cl. 340—347 AD **10 Claims**



1. An analog-to-digital converter for use in cameras comprising:

means for generating a variable digital signal;

means for converting said variable digital signal into a variable analog signal, including means for producing a varying current in response to said variable digital signal and a resistor connected to said producing means to connect said varying current, said producing means including a current mirror circuit having first and second terminals and a current source connected to said resistor for producing a current corresponding to said variable digital signal;

means for receiving an analog input signal;

means for arithmetically combining said analog input signal and said variable analog signal to provide a calculated analog signal, including means for adding a voltage representative of said analog input signal to a voltage appearing across said resistor, said adding means including a first transistor connected between said first terminal and said current source, a second transistor connected between

said second terminal and said resistor, said resistor being located between the emitters of said first and second transistors, and means for connecting said receiving means to the base of said first transistor;

means for comparing to detect whether or not said calculated analog signal has a predetermined relationship with a reference analog signal, including a voltage comparator for comparing a voltage representative of the reference analog signal with the added voltages, wherein the base of said second transistor is connected to said voltage comparator for comparison with the reference signal; and

means responsive to said comparing means for fixing said variable digital signal when said comparing means detects said predetermined relationship, whereby said fixed variable digital signal is representative of the final digital output.

4,400,692

METHOD FOR PERIODIC DIGITAL TO ANALOG CONVERSION

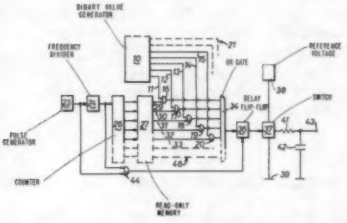
Reto Klein, Leuggern, Switzerland, assignor to BBC Brown, Boveri & Company, Limited, Baden, Switzerland

Filed Nov. 12, 1981, Ser. No. 320,675

Claims priority, application Fed. Rep. of Germany, Nov. 20, 1980, 3043727

Int. Cl.³ H03K *13/02*

U.S. Cl. 340—347 DA 6 Claims



1. A method for converting a digital signal presented in the form of a binary number signal into a analog signal comprising the steps of:

summing during a conversion period the pulses of selected ones of a set of auxiliary pulse trains to form a composite pulse train, wherein: the selected ones of said auxiliary pulse trains are selected in dependence on the value of each binary position of the binary number signal; each one of said auxiliary pulse trains corresponds to one of said binary positions and has a number of pulses equal to the value of 2^N, where N is the number of the corresponding binary position; the pulses in each auxiliary pulse train starting with at least the auxiliary pulse train for the third binary position form pulse groups containing an equal number of pulses; the auxiliary pulse train for the highest number binary position has an even number of pulse groups and the number of pulses in each pulse group are identical to the number of clock pulses in each interval between successive pulse groups; each pulse group in the auxiliary pulse trains other than the auxiliary pulse train for the highest number binary position contain no more than half as many pulses as each pulse group in the auxiliary pulse train for the highest value binary position; and the pulse groups in the auxiliary pulse trains are displaced in time with respect to one another such that pulse groups from each auxiliary pulse train other than the auxiliary pulse train for the highest number binary position can be concatenated with the last pulse, or can precede the first pulse, of a pulse group from the auxiliary pulse train for the highest number binary position when the pulse trains are summed; and

controlling a switch which connects a capacitor to a predetermined voltage source with said composite pulse train in order to charge the capacitor to a voltage constituting the analog signal.

4,400,693

MOS PARALLEL A/D CONVERTER

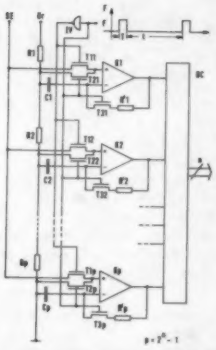
Peter M. Flamm, Freiburg, Fed. Rep. of Germany, assignor to ITT Industries, Inc., New York, N.Y.

Filed Dec. 2, 1981, Ser. No. 326,637

Claims priority, application European Pat. Off., Dec. 11, 1980, 80107811

Int. Cl.³ H03K *13/175*

U.S. Cl. 340—347 AD 2 Claims



1. Monolithic integrated parallel analog-to-digital converter (MOS parallel A/D converter) employing insulated-gate field-effect transistors, comprising $p=2^n-1$ comparators (K1, K2, Kp), a voltage divider applied to a reference voltage (Ur), consisting of p or p−1 resistors (R1, R2, Rp), and a decoder part (DC) connected to the outputs of said comparators, with n being indicative of the number of binary positions of the digital converter output signal, and with all comparator inputs of the one kind (+) being coupled to the signal input (SE) and with the comparator inputs of the other kind (−) being coupled to one voltage divider tap each, characterized by the following features:

each non-inverting comparator input (+) is applied via the controlled current path of a first transfer transistor (T11, T12, T1p) to the signal input (SE) and, via the controlled current path of a second transfer transistor (T21, T22, T2p) to the associated voltage divider tap,

each inverting comparator input (−) is applied via a capacitor (C1, C2, Cp) to the associated voltage divider tap,

each comparator output is applied across a resistor (R'1, R'2, R'p) and via the controlled current path of a third transfer transistor (T31, T32, T3p) as arranged in series therewith, to the inverting comparator input (−),

the gates of the second and of the third transfer transistor (T21, T31; T22, T32; T2p, T3p) are connected with each other and are applied to a clock signal (F) by which they are rendered conductive only during a short interval (T) between conversion, and

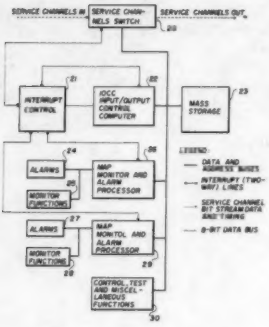
the gates of said first transfer transistors (T11, T12, T1p) are applied to said clock signal (F) via an inverter (IV).

4,400,694

MICROPROCESSOR BASE FOR MONITOR/CONTROL OF COMMUNICATIONS FACILITIES

Raphael W. H. Wong, 3943 Lincolnshire St., Annandale, Va. 22003; Robert R. Ryason, 6913 Ruskin St., Springfield, Va. 22150, and Charles L. Rahm, 1344 Hilton Dr., Reynoldsburg, Ohio 43068

Filed Dec. 3, 1979, Ser. No. 99,367
Int. Cl.[3] G08B *26/00*; G05B *23/02*
U.S. Cl. 340—505 7 Claims



1. A system for providing monitor, alarm and control functions for a communications network wherein said communications network comprises at least one main terminal and a plurality of repeater stations, said system comprising:

a main terminal microcomputer located at said main terminal;

a repeater station microcomputer located at each of said repeater stations;

means for communicating between each of said repeater station microcomputers and said main terminal microcomputer;

control and test means for enabling said main terminal microcomputer to cause a selected repeater station microcomputer to perform selected control and test functions at a selected repeater station;

sensor means at each of said repeater stations for sensing the presence of alarm conditions at said repeater station and for immediately communicating said alarm conditions to said repeater station microcomputer;

monitoring means at each of said repeater stations for continuously monitoring selected operational conditions at said repeater station and for communicating said operational conditions to said repeater station microcomputer;

means, within each of said repeater station microcomputers, for immediately assigning a different priority value to each of said sensed alarm conditions and said sensed operational conditions in accordance with predetermined priority criteria;

processor means, within each of said repeater station microcomputers, for continuously processing said sensed alarm conditions and said sensed operational conditions in order of said assigned priority value;

storage means, within each of said repeater station microcomputers, for storing said processed alarm conditions and operational conditions; and

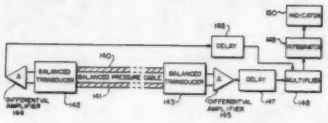
interrupt means for immediately communicating to said main terminal microcomputer processed alarm conditions and operational conditions with a priority value above a predetermined value.

4,400,695

ELECTRONIC INTRUDER DETECTION SYSTEM

Otto E. Rittenbach, Neptune, N.J., and Reinhard G. Olesch, Kronberg, Fed. Rep. of Germany, assignors to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Division of Ser. No. 973,402, Dec. 26, 1978, Pat. No. 4,326,272, which is a continuation-in-part of Ser. No. 840,206, Oct. 7, 1977, Pat. No. 4,187,501. This application Aug. 31, 1981, Ser. No. 297,807
Int. Cl.[3] G08B *13/20*
U.S. Cl. 340—566 5 Claims



1. An intrusion detection system comprising:

first and second fluid-filled cables placed substantially plane parallel at a preselected surveillance location, transducing means at both ends of each cable for converting fluid pressures passively arising within the cables into representative electrical signals;

differential amplifier means connected to said transducing means for generating a signal representative of the difference of fluid pressure in the cables at respective ends of said cables; and

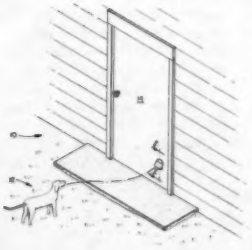
indication means connected to the said differential amplifier means for indicating occurence of an intrusion whenever a threshold level output signal is generated by said differential amplifier means.

4,400,696

ANIMAL ACTUATED ATTENTION ATTRACTING APPARATUS

Robert R. Klingensmith, Box 2010, Sparks, Nev. 89431

Filed Apr. 29, 1981, Ser. No. 258,781
Int. Cl.[3] G08B *23/00*; H01H *3/16*
U.S. Cl. 340—573 11 Claims



1. An attention attracting apparatus for actuation by animals comprising:

alarm means for attracting attention mountable on a door;

a moveable panel for mounting on the door;

tension means for the moveable panel for biasing said panel to a normal alarm means unactuated position, and moveable under pressure by an animal to an alarm means actuating position;

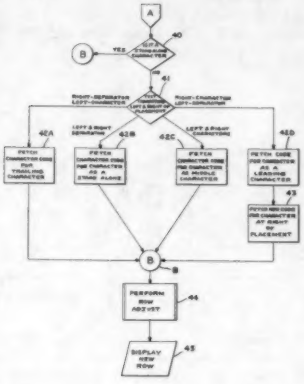
further means for mounting through said door for the dual purpose of providing an electrical contact and also a wire pass through; and

additional means for providing an electrical contact with said further means mounted on said moveable panel.

4,400,697
METHOD OF LINE BUFFER LOADING FOR A SYMBOL GENERATOR

Glenn E. Currie, Mastic, and Erika Fremed, Wantagh, both of N.Y., assignors to Chyron Corporation, Melville, N.Y.

Filed Jun. 19, 1981, Ser. No. 275,277
Int. Cl.³ G09G 9/30
U.S. Cl. 340—711 2 Claims

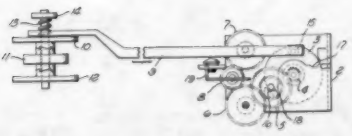


1. In a symbol-display system which includes a keyboard for entering indicia related to the symbols to be displayed and a memory for storing the indicia associated with a line of symbols to be displayed, the symbols being from a font which includes at least one character represented by a set of symbols wherein the actual symbol to be used of the set is determined by the presence or absence on the displayed line of a space symbol immediately adjacent the character, the method of loading said indicia in the memory for the display of at least a line of symbols comprising the steps of providing the keyboard with at least a key for each character that may be displayed as one of the symbols of the associated set, each of said keys representing a base symbol of the set, generating when one of said keys is depressed a base coded-combination of bits, modifying said base coded-combination of bits by changing at least one of the bits in two specific bit positions of said base coded-combination of bits when any immediately adjacent key generated character is a space symbol.

4,400,698
SINGLE CHANNEL RADIO CONTROL SYSTEM

John A. Wessels, Monterey Park, Calif., and Feng I. Chen, Taichung Hsien, China, assignors to Entex Industries, Inc., Compton, Calif.

Filed Dec. 31, 1981, Ser. No. 336,198
Int. Cl.³ G08C 19/00; A63H 30/04; H04Q 7/02
U.S. Cl. 340—825.72 17 Claims



1. A system for remotely controlling the direction and motion of a vehicle which has a means to steer the vehicle, a motor, and a drive means comprising:

(A) means to transmit a single channel continuous wave control signal;

(B) means to receive the control signal;

(C) means to couple the motor to the drive means wherein the coupling means includes a primary drive gear attached to the drive means, a secondary drive gear rotably mounted on the vehicle, an intermediate gear rotably mounted on the vehicle such that the secondary drive gear is in direct drive with the primary drive gear by means of the intermediate gear, a power gear attached to the rotor of the motor, a ring mounted so that it rotates around the axis of the motor rotor, a planetary gear member mounted on the ring and being meshed with the power gear whereby the motion of the motor rotor in one direction causes the ring and the planetary gear member to rotate until the planetary gear member becomes meshed with the primary drive gear and the motion of the motor rotor in the other direction causes the ring and planetary gear member to rotate until the planetary gear member becomes meshed with the secondary drive gear;

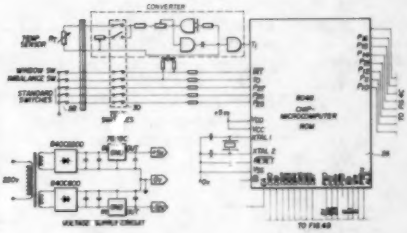
(D) means to change the direction of the motor in response to the control signal;

(E) means to control the means to steer the vehicle in response to the same control signal.

4,400,699
PROGRAM SELECTION APPARATUS

Peter Glasmacher, Munich, Fed. Rep. of Germany, assignor to G. Bauknecht GmbH, Stuttgart, Fed. Rep. of Germany

Continuation-in-part of Ser. No. 63,633, Aug. 2, 1979, abandoned. This application Mar. 19, 1981, Ser. No. 245,406
Claims priority, application Fed. Rep. of Germany, Aug. 4, 1978, 2834351
Int. Cl.³ G05B 11/32; G06F 15/02
U.S. Cl. 340—825.22 5 Claims



1. A program selection apparatus for program-controlled household appliances, such as washing machines, a numeral keyboard having keys for the input of program specifications consisting of coded number digits, a control device, a display device coupled to said numeral keyboard for a continuous display of the program specifications inputted by actuating the various keys of the numeral keyboard,

a signal transducer for indicating faults in inputting number digits forming the program specifications, and,

a control device coupling said numeral keyboad to said display device and to said signal transducer for subsequently and continuously displaying the entry of the various number digits of a program specification inputted through actuating corresponding keys of the numeral key board and on inputting another number digit not compatible in the context of the programmability of the associated household appliance with the number digits already inputted and displayed triggering said signal transducer for indicating a fault in programming and preventing the said not compatible number digit from becoming effective for the program selection, the improvement comprising, said control device adapted to always input a same number of digits for forming a particular program specification upon the inputting of the first coded number digit, whereby said control device triggers said display device to indicate request symbols requesting the subsequent inputting of the

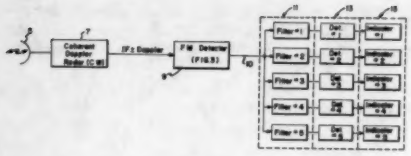
remaining coded number digits belonging to a complete coded program specification.

4,400,700

DOPPLER FREQUENCY ANALYSIS OF RADAR SIGNALS

Otto E. Rittenbach, Neptune, N.J., assignor to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Jun. 8, 1981, Ser. No. 271,725
Int. Cl.³ G01S 9/00
U.S. Cl. 343—55 A 5 Claims



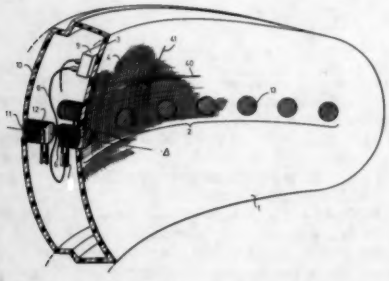
4. The system of claim 3 further comprising store circuits in each of said range gate outputs, with two clock frequencies applied to each of said store circuits, the lower of said clock frequencies being adapted for recording and storing the range gate signals in said store circuits, and the higher frequency clock being adapted for playback of the stored signals to the subsequent circuitry when the storage circuit of a particular range gate is sampled by said multiplexer switch.

4,400,701

COMMON ANTENNA FOR PRIMARY AND SECONDARY RADAR

Albert Dupressoir, Paris, France, assignor to Thomson-CSF, Paris, France

Filed Jan. 23, 1981, Ser. No. 227,770
Claims priority, application France, Jan. 28, 1980, 80 01760
Int. Cl.³ H01Q 15/22
U.S. Cl. 343—725 11 Claims



1. A bifunctional antenna for a primary/secondary radar system, comprising:

a reflector formed of a body of dielectric material with a reflective surface of crossed wires, said reflector being adapted to be illuminated by a primary source of outgoing radiation for detecting a remote target;

a row of emitters of secondary radiation disposed along a generatrix of said front surface intersecting a boresight axis, said emitters being formed by circular ports in said front surface backed by cylindrical cavities having walls integral with said body, said cavities being coaxial with said ports and having axes extending in radial directions of said front surface; and

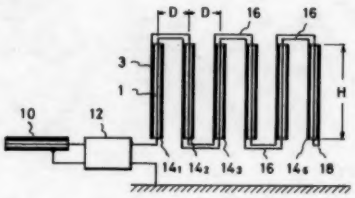
wave-control means in said cavities adapted to establish a circular mode of polarization for the secondary radiation emitted thereby.

4,400,702

SHORTENED ANTENNA HAVING COAXIAL LINES AS ITS ELEMENTS

Hiroki Tanaka, 1071-2, Hayashigaki, Wadayama-cho, Asago-gun, Hyogo-ken, Japan

Filed Apr. 13, 1981, Ser. No. 253,195
Claims priority, application Japan, May 13, 1980, 55-63755
Int. Cl.³ H01Q 9/42
U.S. Cl. 343—790 3 Claims



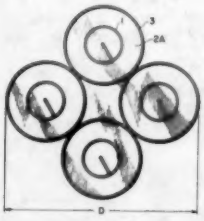
1. An antenna comprising at least one fundamental antenna element composed of a coaxial line having a length corresponding to one-half or one-quarter wavelength of utilization waves and divided into a plurality of discrete segments, means connecting said segments in series with the inner conductor of one of the adjoining segments being connected to the outer conductor of the other of said adjoining segments and the outer conductor of said one adjoining segment being connected to the inner conductor of said other adjoining segment, said connecting means forming joints between successive segments and said antenna segments being folded at said joints between successive segments, whereby in-phase unbalanced currents flow in the adjoining segments.

4,400,703

SPIRAL ARRAY ANTENNA

Takayasu Shiokawa, and Yoshio Karasawa, both of Tokyo, Japan, assignors to Kokusai Denshin Denwa Kabushiki Kaisha, Tokyo, Japan

Filed Jun. 2, 1981, Ser. No. 269,452
Claims priority, application Japan, Jun. 24, 1980, 55-84625
Int. Cl.³ H01G 1/36
U.S. Cl. 343—895 3 Claims



1. An array antenna comprising:

a plurality of element antennas disposed closely adjacent to one another, each of said element antennas comprising an axial-mode helical antenna with an antenna height of 0.4λ to 0.6λ (λ: Wave length); and

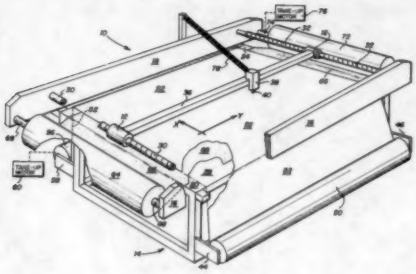
a plurality of cylindrical metallic rims coaxially surrounding the said element antennas, respectively, for suppressing degradation of antenna characteristics caused by mutual coupling between the said element antennas, each of said metallic rims having a height of approximately 0.25λ.

4,400,704

PLOTTER HAVING CONTINUOUSLY MOVING CARBON PAPER HANDLING SYSTEM

Henry C. Brown, and Fredrick N. Mueller, both of Dallas, Tex., assignors to Camsco, Inc., Richardson, Tex.

Filed Apr. 7, 1982, Ser. No. 366,167
Int. Cl.³ G01D 9/00, 15/24; B41J 3/28
U.S. Cl. 346—29 7 Claims



1. A plotting system including a plotting device for plotting on paper comprising:

a work surface having opposed ends and sides;

a supply source of paper to be plotted disposed adjacent said work surface;

first take-up means disposed adjacent said work surface opposite said supply source of paper;

a supply source of carbon paper disposed adjacent said work surface;

second take-up means disposed adjacent said work surface opposite said supply source of carbon paper;

means interconnected to said first take-up means for periodically advancing the paper across said work surface from said supply source of paper to said first take-up means; and

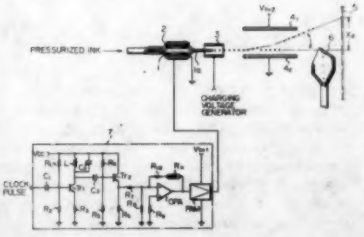
means interconnected to said second take-up means for continuously advancing the carbon paper across said work surface from said carbon paper supply source to said second take-up means while the plotting device plots on the paper.

4,400,705

INK JET PRINTING APPARATUS

Masanori Horike, Tokyo, Japan, assignor to Ricoh Company, Ltd., Tokyo, Japan

Filed Dec. 8, 1980, Ser. No. 214,559
Claims priority, application Japan, Dec. 18, 1979, 54-164610
Int. Cl.³ G01D 15/18
U.S. Cl. 346—75 1 Claim



1. An ink jet printing apparatus including an ink ejection head, vibrator means for applying pressure oscillation to the head thereby causing a jet of ink to be ejected from the head and separate into droplets, charging means for applying an electrostatic charge to the droplets and deflection means for deflecting the charged droplets, characterized by comprising:

ink temperature sensor means for sensing an ink temperature; and

computing means for controlling an amplitude of pressure oscillation applied by the vibrator means to the head as a function of sensed ink temperature which is predetermined in such a manner that an amount of deflection of the charged droplets is the same at all ink temperatures;

the computing means being constructed to control the vibrator means in such a manner as to increase the amplitude of pressure oscillation as the ink temperature decreases and vice-versa;

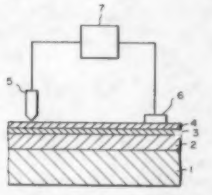
the vibrator means comprising an electrostrictive vibrator fixed to the head, an A.C. signal generator for producing a constant A.C. signal, and an amplifier connected between the generator and the vibrator, the computing means controlling an amplification factor of the amplifier in accordance with an output of the sensor means.

4,400,706

DISCHARGE RECORDING MEDIUM

Shuji Takemura, Chiba; Kazumi Hirakawa, and Tsuneto Yoshizumi, both of Tokyo, all of Japan, assignors to Honshu Seishi Kabushiki Kaisha, Tokyo, Japan

Filed Jul. 28, 1981, Ser. No. 287,686
Claims priority, application Japan, Jul. 30, 1980, 55-103593
Int. Cl.³ G01D 15/06
U.S. Cl. 346—135.1 5 Claims



1. In a discharge recording medium comprising a colored insulating layer comprising an insulating bonding resin with or without a coloring agent, a metal-vaporized layer and, if desired, a protection layer that are formed in that order on a support member, the improvement wherein the colored insulating layer contains a graphite powder having an average particle diameter of 0.1 to 50 μm in amounts of greater than about 15 parts by weight per 100 parts by weight of a bonding resin which is contained in said colored insulating layer, so that the colored insulating layer has a surface resistivity of 10^{10} to 10^{13} ohms.

4,400,707

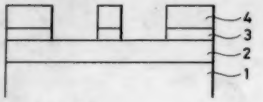
RECORDING MEDIUM

Munehisa Mitsuya, Hachioji; Motoyasu Terao, Hinodemachi; Sakae Ota, Yokohama; Yoshio Taniguchi, Hino; Toshimitsu Kaku, Hachioji, and Shinkichi Horigome, Tachikawa, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Aug. 6, 1981, Ser. No. 290,654
Claims priority, application Japan, Aug. 20, 1980, 55-113510
Int. Cl.³ G01D 15/34
U.S. Cl. 346—135.1 20 Claims

1. A recording medium comprising a substrate, an inorganic material layer which is formed on said substrate and which absorbs light and generates heat, a first organic material layer which is formed on said inorganic material layer and which is

made of at least one metal-containing organic compound, and a second organic material layer which is formed on said first



organic material layer and which is deformed or removed by heat.

4,400,708

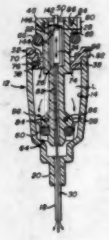
DISPOSABLE INKER CARTRIDGE AND HOLDER THEREFOR

Richard L. Sachs, 11072 Bel Aire Ct., Cupertino, Calif. 95014

Filed Aug. 28, 1981, Ser. No. 297,184

Int. Cl.³ G01D *15/16*

U.S. Cl. 346—140 R **11 Claims**



1. An inker device for mounting a disposable inker cartridge on a machine for testing each individual integrated circuit of a semiconductor wafer, the inker cartridge arrangeable for marking selected circuits of the wafer, the device comprising, in combination:

(a) an elongated element having a projection extending perpendicular therefrom, the projection defining an opening arranged for receiving a needle of an inker cartridge;

(b) an annular electrical solenoid coil defining a through bore mounted on said element in spaced relation to said projection bore oriented on line with the opening; and

(c) core means slideably insertable in the bore of said annular coil and engageable with a cartridge mounted on said bracket for being moved when said coil is energized and causing ink to be dispensed from said cartridge.

4,400,709

IMAGE PRINTER STYLUS BAR, MANUFACTURING METHOD THEREFOR AND IMAGE PRINTER DEVICE

Alain de Kermadec, Rochefort en Yvelines, and Christian Delanoe, Versailles, both of France, assignors to Compagnie Industrielle des Telecommunications Cit-Alcatel, Paris, France

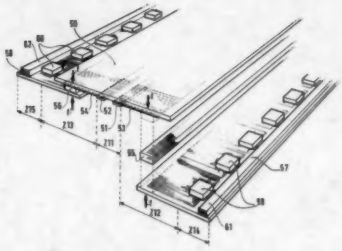
Filed Jul. 14, 1980, Ser. No. 168,910

Claims priority, application France, Jul. 13, 1979, 79 18269; Jul. 13, 1979, 79 18270; Jun. 27, 1980, 80 14398

Int. Cl.³ G01D *15/06*

U.S. Cl. 346—154 **21 Claims**

1. A stylus bar for two-state printing on electrosensitive paper scanned in successive lines by said bar which comprises as many mutually insulated styli forming a stylus area on said bar as there are image points in each scanning line and a shift register type memory receiving data defining said image points, with a shift control input and supply inputs and with parallel outputs individually controlling said styli and thereby the marking of said image points on said paper, the stylus bar being characterized in that said memory comprises 2.m register stage chips each with a serial data input, n parallel outputs, a serial data output and control inputs comprising a clock input controlling the shifting of data from one register stage to the next and two feed inputs defining two voltage levels corresponding to the levels of said data, m and n being integers such that the product 2.m.n. is at least equal to the number of styli, said chips being supported on at least one film and connected in series in two groups of m chips with their control inputs of the same type placed in parallel, with its m chips arranged basically in a same plane and each with an input series of data



and constituting two separate shift registers each with m.n parallel outputs, at least some of which consecutive parallel outputs of said m chips in series and forming useful parallel outputs of the m chips of the register in question being connected to respective styli of like rank in said stylus area, so that respective regsiters are connected to odd ranked styli and to even ranked styli in the stylus area, so as to simultaneously feed said styli with one of said voltage levels, according to the binary data level present on respective useful parallel outputs of said chips, representing individual control signals for the styli to which they are connected.

4,400,710

SEMICONDUCTOR DEVICE

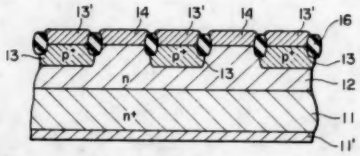
Jun-ichi Nishizawa; Tadahiro Ohmi, and Keishiro Takahashi, all of Sendai, Japan, assignors to Zaidan Hojin Handotai Kenkyu Shinkokai, Sendai, Japan

Filed Nov. 25, 1980, Ser. No. 210,531

Claims priority, application Japan, Nov. 26, 1979, 54-153388

Int. Cl.³ H01L *29/48, 29/74, 29/80*

U.S. Cl. 357—15 **27 Claims**



1. A semiconductor device, comprising:

a first lightly-doped semiconductor region of a first conductivity type and having a principal surface;

a second highly-doped semiconductor region of a second conductivity type opposite to said first conductivity type formed at said principal surface of said first semiconductor region to form a pn junction therewith and surrounding a portion of said first semiconductor region to define a current channel region therein:

a Schottky metal electrode connected to that part of said principal surface corresponding to said current channel region of said semiconductor region; and

a carrier-collecting highly-doped semiconductor region disposed adjacent to said first semiconductor region on

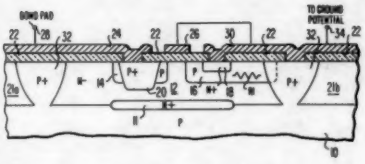
that side of said first semiconductor region located opposite to said principal surface for extracting majority carriers injected from said Schottky metal electrode, through said channel region said second semiconductor region being responsive to forward bias signals applied thereto, said majority carriers injected from said Schottky metal electrode increasing with an increase of said forward bias voltage.

4,400,711

INTEGRATED CIRCUIT PROTECTION DEVICE

Leslie R. Avery, Flemington, N.J., assignor to RCA Corporation, New York, N.Y.

Filed Mar. 31, 1981, Ser. No. 249,612
Int. Cl.³ H01L 27/02
U.S. Cl. 357—43 12 Claims



1. A semiconductor protection circuit comprising:

a semiconductor substrate of a first conductivity type;

a semiconductor layer of a second conductivity type disclosed on said substrate, said semiconductor layer having a surface;

first and second semiconductor regions of said first conductivity type, each disposed in PN junction forming relation with said semiconductor layer;

a third semiconductor region of said second conductivity type disposed in PN junction forming relation with said second semiconductor region;

a layer of insulating material disposed on the surface of said semiconductor layer lying between said first and second semiconductor regions;

a layer of conductive material disposed on said insulating layer; and

conductive means for connecting said conductive layer to one of said first and third semiconductor regions.

4,400,712

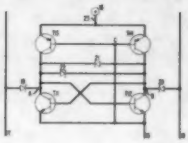
STATIC BIPOLAR RANDOM ACCESS MEMORY

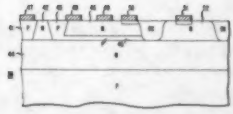
Kevin J. O'Connor, Center Valley, Pa., assignor to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed Feb. 13, 1981, Ser. No. 234,453
Int. Cl.³ H01L 27/10; G11C 11/40
U.S. Cl. 357—44 1 Claim

1. A semiconductive device comprising a semiconductive chip including an array of memory cells, each memory cell being a bistable circuit including first and second cross-coupled driver junction transistors and first and second load driver junction transistors, each cell portion of the chip comprising a substrate portion of one conductivity type, a pair of surface portions separated from one another by a dielectric trench and overlying said bulk portion, each of said surface portions including an emitter region, a base region and a collector region for forming a lateral transistor, and a buried base region and a collector region for forming with an emitter region in the substrate portion a vertical transistor, the collector region of the lateral transistor merging with the buried base region of the verical transistor and the base region of the lateral transistor merging with the substrate emitter region of the vertical transistor, each surface portion further including a first electrode making low resistance connection to the emitter region of the lateral transistor, a second electrode making low resistance connection to the collector region of the lateral transistor and a Schottky connection to the collector region of the vertical transistor, a third electrode making Schottky connection to the collector region of the verical transistor, and a fourth electrode making low resistance connection to the collector of the vertical transistor,

the first electrodes of each of the two surface portions being adapted to be connected to a common current source, the second electrode of each of the two surface portion being separately connected to the fourth electrode of the other surface region, and the third electrode of each surface region being connected separately to a different one of two bit lines,





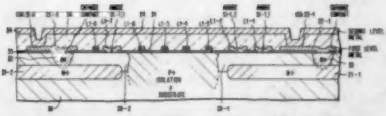
the base of the lateral transistor and the emitter and collector of the vertical transistor being of the same conductivity type as the substrate portion and the emitter and collector of the lateral transistor and the base of the vertical transistor being of the opposite conductivity, the buried base region of the vertical transistor terminates in the wall of the dielectric trench without reaching the surface except where the base region merges with the collector of the lateral transistor, and the first and second surface portions are oppositely oriented so that the lateral transistor in each surface portion is proximate the vertical transistor of the other surface portion.

4,400,713

MATRIX ARRAY OF SEMICONDUCTING ELEMENTS

Michel G. Bauge, Lesigny, and Pierre B. Mollier, Boissise le Roi, both of France, assignors to International Business Machines Corp., Armonk, N.Y.

Filed Dec. 5, 1980, Ser. No. 213,288
Claims priority, application France, Dec. 7, 1979, 79 30421
Int. Cl.³ H01L 27/10, 27/02, 27/04, 29/56
U.S. Cl. 357—45 7 Claims



1. An integrated matrix array of semiconductive elements embedded in a substrate, the points of said array being defined by the intersection of parallel lines of a first set with parallel lines of a second set, said points being provided, or not provided, with said semiconductive elements which have a first electrode connected to a line of a first set and a second electrode connected to a line of a second set, the array being of the

type in which the first electrodes of the semiconductive elements in each column or row are defined in a common sub-collector semiconductive region, the second electrodes being defined by contact with an epitaxial layer and provided only in positions in which a semiconductive element is to be operative, said array being arranged such that:

(a) the semiconductive elements in each column or row are partitioned into groups of 2k elements;

(b) in each group, said sub-collector semiconductive region and said epitaxial layer are selectively discontinuous, being partitioned into two portions, the first portion extending from one end of the group to the position having an operative semiconductive element closest to the mid-point of the group, and the second portion extending from the other end of the group to the position having an operative semiconductive element closest to the mid-point of the group;

(c) connecting means extending between said ends of the two portions of said sub-collector semiconductive region in each group of semiconductive elements;

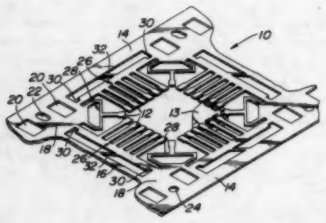
(d) said substrate being of first conductivity-type, and in which in each group, said two portions comprise the semiconductive epitaxial layer and the common sub-collector semiconductive region, both of opposite conductivity-type, both portions being isolated by an isolation region of said first conductivity type.

4,400,714

LEAD FRAME FOR SEMICONDUCTOR CHIP

Don B. Brown, Willow Grove, Pa., assignor to Jade Corporation, Huntingdon Valley, Pa.

Filed Nov. 6, 1980, Ser. No. 204,395
Int. Cl.³ H01L *23/48*
U.S. Cl. 357—70 **7 Claims**



1. A lead frame of the type wherein electrical conductor leads are integrally formed with the frame in a spaced-apart relationship in the plane of the frame in order that the leads may be positioned and aligned for bonding the lead tips to a substrate, comprising:

(a) a relatively rigid outer frame;

(b) a plurality of elongated electrical conductor leads, each supported at one end within the lead frame and having a free end for bonding to a substrate;

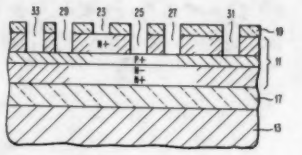
(c) a plurality of lead support members integral with the outer frame and the leads, the support members being spaced apart from and within the boundaries of the outer frame and having ends attached to the outer frame, each lead being integrally joined at one end to a support member and extending inwardly from the support member, the support members having reduced physical dimensions where they are attached to the outer frame so that the support members will deform outwardly in the plane of the frame to accommodate outward expansion of the leads during bonding without causing the leads, the support members or the outer frame to deform in a direction outside the plane of the frame.

4,400,715

THIN FILM SEMICONDUCTOR DEVICE AND METHOD FOR MANUFACTURE

Steven G. Barbee, Dover Plains, N.Y.; James M. Leas, Washington, D.C.; James R. Lloyd, Fishkill, and Arunachala Nagarajan, Wappingers Falls, both of N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Nov. 19, 1980, Ser. No. 208,442
Int. Cl.³ H01L *27/12*
U.S. Cl. 357—49 **7 Claims**



1. A thin film semiconductor device comprising:

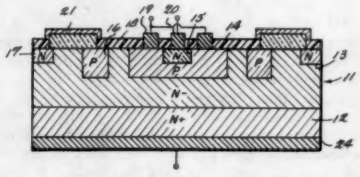
a substrate including at least one surface which is of a insulating dielectric material, a plurality of overlying layers of doped monocrystalline semiconductor material united to the insulating dielectric material, said doped monocrystalline layers being converted doped polycrystalline semiconductor material, a plurality of circuit elements in the layers, selected trenches isolating the circuit elements from each other, an insulating layer on the surface of the overlying layers and on the vertical surfaces of the trenches, and a metallization pattern contacting the circuit elements through the remaining trenches whereby a full dielectric isolation of the circuit elements is achieved in the device.

4,400,716

SEMICONDUCTOR DEVICE WITH GLASS LAYER CONTACTING OUTER PERIPHERY OF GUARD RING AND ADJACENT SUBSTRATE

Keizo Tani, Yokohama, and Makoto Hideshima, Kawasaki, both of Japan, assignors to Tokyo Shibaura Denki Kabushiki Kaisha, Kawasaki, Japan

Filed Dec. 23, 1980, Ser. No. 220,159
Claims priority, application Japan, Jan. 17, 1980, 55-3052
Int. Cl.³ H01L *29/34*
U.S. Cl. 357—54 **8 Claims**

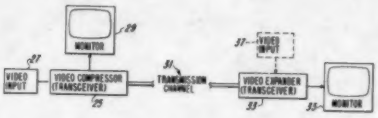


1. A semiconductor device comprising a substrate of first conductivity type, a main region of second conductivity type formed on said substrate, a guard ring region of second conductivity type formed surrounding said main region, an oxide film covering the surface of said susbtrate between said main region and said guard ring region, and a glass film directly covering only the outer periphery of the surface of said guard-dring and only the surface of said substrate adjacent and outside of said guard ring region.

4,400,717
COLOR SLOW-SCAN TV SYSTEM AND METHOD

Glen R. Southworth, Boulder; Larry R. McClelland, and Bruce F. Johnson, both of Longmont, all of Colo., assignors to Colorado Video Incorporated, Boulder, Colo.

Filed Apr. 21, 1981, Ser. No. 256,207
Int. Cl.³ H04N 9/32
U.S. Cl. 358—13 75 Claims



1. A color slow-scan TV system, comprising:

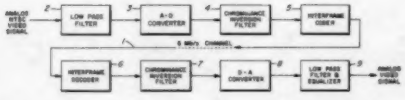
a transmitter having first memory means and first and second signal processing means, said first signal processing means being adapted to accept an encoded video input signal having chrominance and luminance components indicative of a color TV picture and digitizing the same, with said digitized signal being written into said first memory means, and said digitized signal being read out of said memory means by said second processing means in an orthogonal manner as a color slow-scan analog signal for transmission; and

a receiver having second memory means and third and fourth signal processing means, said third signal processing means being adapted to accept said color slow-scan analog signal transmitted by said transmitter and digitizing the same, with said digitized signal being written into said second memory means is an orthogonal manner, and said digitized signal being read out of said second memory means by said fourth processing means to reconstruct said color TV picture for display.

4,400,718
DIGITAL TELEVISION TRANSMISSION USING CHROMINANCE INVERSION

Pok F. Lee, Richmond, Canada, assignor to Northern Telecom Limited, Montreal, Canada

Filed Jun. 4, 1981, Ser. No. 270,591
Int. Cl.³ H04N 9/32
U.S. Cl. 358—13 6 Claims



1. A method of transmitting an NTSC colour video signal via a digital signal transmission channel, comprising the steps of:

inverting components of said video signal in the chrominance spectral band in alternate television frames to produce an alternate-frame chrominance-inverted video signal;

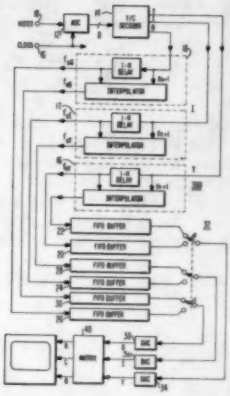
transmitting said alternate-frame chrominance-inverted video signal via said digital signal transmission channel in the form of a digital signal encoded using interframe difference coding at a transmitter and decoding at a receiver; and

inverting components of the decoded video signal in the chrominance spectral band in the other alternate television frames which were not inverted at the transmitter to produce a chrominance-inverted video signal at the receiver.

4,400,719
TELEVISION DISPLAY SYSTEM WITH REDUCED LINE-SCAN ARTIFACTS

Kerns H. Powers, Princeton, N.J., assignor to RCA Corporation, New York, N.Y.

Filed Sep. 8, 1981, Ser. No. 300,227
Int. Cl.³ H04N 9/535
U.S. Cl. 358—21 R 13 Claims



2. A method for producing a flat-field representation of a line-scanned image, said method comprising the steps of:

producing scanned lines of composite color television signals each of which is representative of a line scan of the image information, which scanned lines of composite color television signals, if displayed, produce an objectionable line-scan structure;

storing at least one line of said scanned lines of composite color television signals to produce stored video;

comparing said stored video with at least one temporally adjacent scanned line of television signals to produce an estimated value of the video which would be produced by a line-scan of said image between said stored and adjacent lines, thereby producing an estimated line of video, said comparing step further comprising the step of separating the luminance component from the chrominance component of said composite video;

time-compressing said stored, estimated and adjacent lines by a factor related to the quotient of a sum and the number of scanned lines of composite color television lines per frame, where said sum is the sum of the number of said estimated lines and said scanned lines per frame; and

displaying fields of video by progressive scanning of said scanned lines of color television signals alternated with said estimated lines of video whereby said objectionable line-scan structure is made less visible.

4,400,720
DYNAMIC DE-EMPHASIS COMPENSATION SYSTEM

Werner Hinn, Zollikerberg, Switzerland, assignor to RCA Corporation, New York, N.Y.

Filed Jun. 4, 1981, Ser. No. 271,034
Claims priority, application United Kingdom, May 7, 1981, 8114021
Int. Cl.³ H04N 9/38
U.S. Cl. 358—25 6 Claims

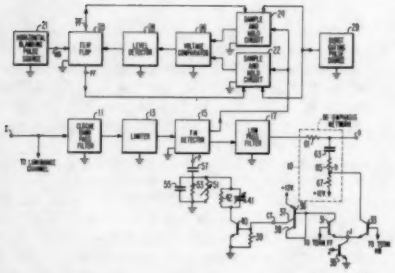
1. In a color television receiver subject to reception of composite color television signals having periodic vertical blanking intervals interposed between successive sequences of active line intervals, and inclusive of a chrominance component encoded in SECAM format; said SECAM-encoded chrominance component comprising: (a) during image portions of alternate

active line intervals, a first subcarrier having a first resting frequency and subject to frequency modulation over a given frequency deviation range in accordance with a first pre-emphasized color-difference signal; and (b) during image portions of the intervening active line intervals, a second subcarrier having a second resting frequency and subject to frequency modulation over said given frequency deviation range in accordance with a second pre-emphasized color-difference signal; with a lead-in burse of oscillations at said first resting frequency preceding the image portion of each of said alternate active line intervals, and with a lead-in burst of oscillations at said second resting frequency preceding the image portion of each of said intervening active line intervals, apparatus comprising:

an FM detector, responsive to the received signals, and subject to operation in either a first mode with center frequency tuning corresponding to the resting frequency of said first subcarrier, or a second mode with center frequency tuning corresponding to the resting frequency of said second subcarrier;

a triggered flip-flop circuit for providing a half line rate wave output;

a source of line rate pulses timed to encompass the periods of



appearance of said lead-in bursts to the exclusion of the periods of appearance of said modulated subcarriers;

means, responsive to said line rate pulses, and to said half line rate wave output, for controlling the operating mode of said FM detector such that said FM detector operates in respectively different ones of said modes during the image portions of successive active line intervals but operates in only said first mode during the periods of appearance of said lead-in bursts;

identification means, responsive to an output of said FM detector, and responsive to said half line rate wave output, for controlling the phasing of said half line rate wave output;

de-emphasis means, having an input terminal and an output terminal, said input terminal being coupled to receive a demodulated signal output of said FM detector, for subjecting said demodulated signal output to a frequency response characteristic exhibiting a response decline with increase in signal frequency over at least a portion of the frequency range occupied by said color-difference signals;

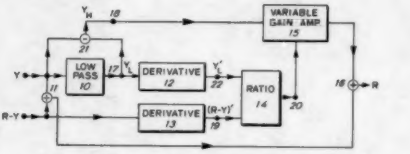
means, responsive to line rate pulses from said source, and to said half line rate wave output, for delivering to said output terminal a differentiated version of recurring pulses which have leading and trailing edges timed to coincide with the changes of operating mode of said FM detector.

4,400,721

TRANSITION SYSTEM FOR COLOR TELEVISION RECEIVERS

Albert Macovski, 2505 Alpine Rd., Menlo Park, Calif. 94025

Filed Jul. 13, 1981, Ser. No. 282,400
Int. Cl.³ H04N 9/535
U.S. Cl. 358—37 **4 Claims**



1. In a method for enhancing the high frequency response of color television signals which are derived from a luminance signal and a plurality of color difference signals the steps of:

low-pass filtering the luminance signal;

deriving the high frequency components of the luminance signal by subtracting the low-pass filtered luminance signal from the luminance signal; and

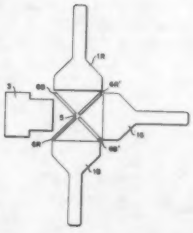
applying the high frequency components of the luminance signal to the color television signals in an amount proportional to components of the color-difference signals.

4,400,722

OPTICAL CONFIGURATION FOR PROJECTION TELEVISION APPARATUS

Yoshito Miyatake, Moriguchi; Yoshitomi Nagaoka, Neyagawa, and Yasuo Nakajima, Hirakata, all of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka, Japan

Filed May 4, 1981, Ser. No. 261,136
Claims priority, application Japan, May 7, 1980, 55-60889
Int. Cl.³ H04N 9/31
U.S. Cl. 358—60 **5 Claims**



1. A projection television apparatus comprising:

three cathode ray tubes for emitting red, green and blue images respectively and which are placed with their optical axes in a single plane at 90° to each other with the faceplates thereof adjacent each other to define a rectangular parallelepiped shaped space;

two dichroic mirrors in said space with the surfaces facing said faceplates of said tubes and in an X shaped configuration when viewed from the edges of said mirrors, each mirror reflecting a different color than the other mirror, at least one of said dichroic mirrors consisting of two small dichroic mirror parts which are separated at the line of intersection where said two dichroic mirrors cross each other, each small dichroic mirror part having a single transmission characteristic which is different from the same single transmission characteristic of the other small dichroic mirror part for minimizing the difference in brightness ratios of the respective colors transmitted; and

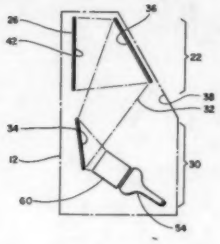
a lens on the opposite side of said space and positioned on the optical axis of the center tube of said three tubes.

4,400,723

OPTICAL ASSEMBLY FOR PROJECTION TELEVISION RECEIVER

Michael A. Fanizza, Mount Prospect, and Richard G. Schmid, Glenview, both of Ill., assignors to Zenith Radio Corporation, Glenview, Ill.

Filed Oct. 26, 1981, Ser. No. 314,591
Int. Cl.³ H04N *9/31*
U.S. Cl. 358—60 **2 Claims**



1. For use in an ultra-compact, jack-in-the-box rear projection television receiver housed in a cabinet, stationary optical assembly means permanently installed in a lower portion of said cabinet for forming a television image and projecting said image steeply upwardly a predetermined image projection distance along an optical path folded by optical path folding means, said receiver including a unitary optical assembly having a viewing screen selectively storable in said cabinet and elevatable therefrom for receiving and displaying said image, said stationary optical assembly comprising, in combination:

image source means having a red, a green, and a blue image-forming cathode ray tube for forming a composite television image, each of said tubes having an associated projection lens means on a substantially common axis therewith for projecting an aerial image of said television image along said optical path, said image source means including cathode ray tube holding assembly means for holding said tubes and said projection lens means in proper alignment;

mirror means for receiving and reflecting said aerial image;

chassis means for receiving and supporting said image source means and said mirror means, said chassis means having a first platform oriented at an upward projection angle for mounting said cathode ray tube holding assembly means, and a second platform oriented at a steeply upward reflection angle for mounting said mirror means;

such that a television image is formed and an aerial image of the television image is projected steeply upwardly towards said unitary optical assembly for display of said television image on said screen.

4,400,724

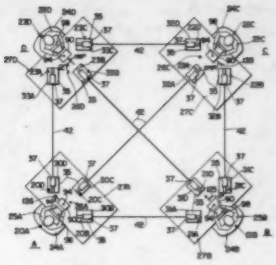
VIRTUAL SPACE TELECONFERENCE SYSTEM

Craig I. Fields, Washington, D.C., assignor to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Jun. 8, 1981, Ser. No. 271,062
Int. Cl.³ H04H *7/18*
U.S. Cl. 358—85 **17 Claims**

1. A teleconference system for N conferees, N being greater than two, comprising:

a plurality of stations, each station having N conferee positions confronting a virtual conference space, corresponding conferee positions at each station having the same relative locations about the virtual conference space, at least one of the conferee positions at each station being an actual conference position adapted to be occupied by a conferee in person, and video cameras for viewing said actual conferee positions coupled to video display devices at conferee positions at other stations corresponding to the viewed actual conferee positions for displaying the image



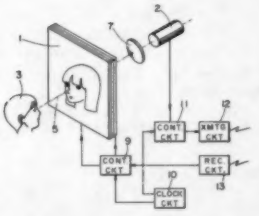
of the actual conference position at each station at corresponding positions at the other stations, each station having at least (N-1) of said video cameras and video dispiay devices.

4,400,725

PICTURE DISPLAY-IMAGE PICKUP APPARATUS

Suzuyo Tanigaki, 4-8-3, Nakashizu, Sakura-shi, Chiba-ken, Japan

Continuation of Ser. No. 162,591, Jun. 24, 1980, abandoned. This application Feb. 8, 1982, Ser. No. 346,602
Claims priority, application Japan, Jan. 25, 1980, 55-22535; Jan. 25, 1980, 55-22535
Int. Cl.³ H04N *7/18*
U.S. Cl. 358—85 **15 Claims**



1. A picture display-image pickup apparatus for visual communication comprising a display element made of a transillumination controllable material, the transparency and opaqueness of which may be controlled in accordance with an applied electric field, used in a picture display device which is arranged to face a talker, said picture display device further comprising an image pickup device, said image pickup device being arranged inside of and on the common optical axis of said display device.

4,400,726

TELEVISION SIGNAL DISTRIBUTION EQUIPMENT FOR A CABLE NETWORK AND INCLUDING A STABILIZER

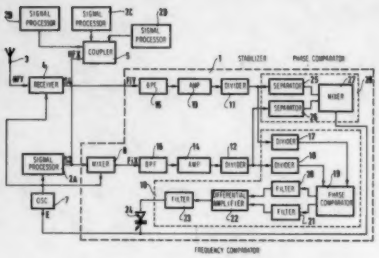
Erick Van Hulle, Waterloo, Belgium, assignor to Societe Anonyme dite: VISIODIS, Aubervilliers, France

Filed Sep. 23, 1980, Ser. No. 189,883
Claims priority, application France, Jul. 18, 1980, 80 15909
Int. Cl.³ H04N *7/10*
U.S. Cl. 358—86 **13 Claims**

1. Television signal distribution equipment for a cable network including at least one signal processing circuit (2A)

suitable for transmitting signals over a channel of the network, said signal processing circuit using synchronizing signals which are subject to interference from external interfering synchronization signals:

the distribution equipment comprising at least one receiver suitable for receiving the external interfering synchronization signals, and at least one stabilizer (1) for eliminating disturbances in the synchronizing signals used by the signal processing circuit (2A) that are caused by the interference from the external synchronization signals; and



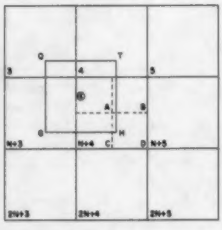
wherein the stabilizer (1) comprises a frequency comparator (10) and a phase comparator (28) in parallel having inputs connected in common both (i) to an output of the signal processing circuit (2A) using the synchronizing signals which are subject to interference, and (ii) to an output of the signal receiver (4) receiving the external interfering synchronization signals, the frequency and phase comparators having their outputs connected to respective terminals of a voltage sensitive tuning component (24) associated with an oscillator (7) for the processing circuit processing circuit (2A) to the frequency of the interfering synchronization signals.

4,400,727

MOVING MAP DISPLAY

Mitchell Aron, Harrington Park, N.J., assignor to The Bendix Corporation, Teterboro, N.J.

Filed Nov. 27, 1981, Ser. No. 325,610
Int. Cl.³ H04N 7/18
U.S. Cl. 358—103 **7 Claims**



1. A moving map display showing features and other information regarding the area about a moving aircraft wherein a navigation system thereon indicates the position of the craft, wherein a mapped area is made up of a number of contiguous smaller area map segments with each map segment being stored as a video signal in a video storage means, and said map display has a composite map segment displayed that may be made up of portions of more than one stored map segment comprising:

switching means connected to said navigation system indicating the position of said craft for selecting, in response to information from the navigation system, ones of said stored map segments, portions of the video signals of which are required to make up said composite map segment to be displayed, and

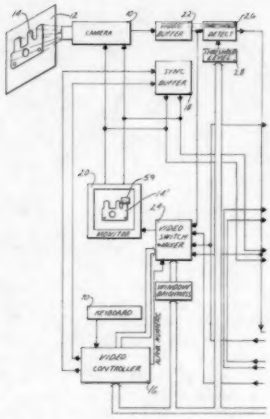
read means, under control of said switching means, for reading portions of the video signals for said selected map segments from the video storage means to make up said composite map signal.

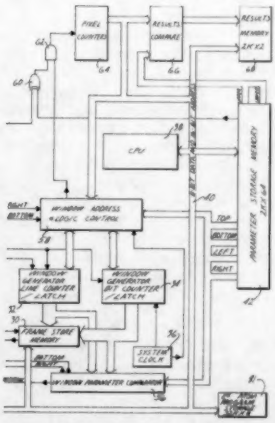
4,400,728

VIDEO PROCESS CONTROL APPARATUS

David J. Long, Wrightwood, Calif., assignor to Everett/Charles, Inc., Fontana, Calif.

Filed Feb. 24, 1981, Ser. No. 237,689
Int. Cl.³ H04N 7/18
U.S. Cl. 358—107 **12 Claims**





1. Video process control apparatus comprising video camera means including raster scan means for generating a video output signal of the image field of the camera, means dividing the video signal into a series of pixels, means converting each pixel to a binary bit whose value indicates whether the amplitude of the video signal is above or below a predetermined threshold amplitude, frame memory means storing the bits converted from pixels forming one frame of the raster scan, digital memory means storing a plurality of digitally coded

words, each word defining the margins of one predetermined window area within the image field of the camera, each word further defining the desired number of bits of one value corresponding to pixels within the defined area, means for reading out a selected full word at a time from the digital memory means, counter means, control means responsive to any selected word read out of said memory means for transferring all the bits of one value corresponding to pixels within the area defined by the selected word from the frame memory means to the counter, and means responsive to the selected word read out of said memory and the counter means for comparing the number of bits counted with the desired number of bits defined by said selected word.

4,400,729

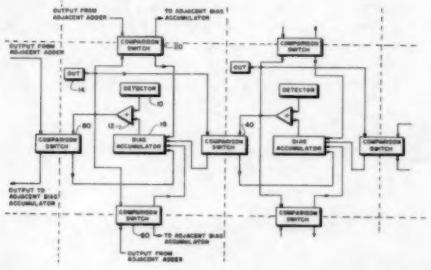
PSEUDO-DC RESTORE APPLICATION TO STARING ARRAY DETECTORS

George R. Jones, 113 Northway Rd., Greenbelt, Md. 20770

Filed Dec. 3, 1980, Ser. No. 212,296

Int. Cl.³ H04N *5/16, 5/33*

U.S. Cl. 358—113 **1 Claim**



1. A method of DC restoration in a staring array detector system on a monolithic semiconductor by continuously comparing the detector output of each sensor cell with the outputs from detectors in adjacent sensor cells over all of the staring array, said means comprising:

generating an uncorrected detector output from each of the detectors in said staring array detector system;

supplying the generated uncorrected detector output to one of two inputs of an adder;

providing an output signal from said adder which is applied by circuit components integrated into said monolithic semiconductor to readout means and is simultaneously applied to signal comparison means in four adjacent comparison switches for comparing said output signal from said adder in said signal comparison means to the output signals from each of the adjacent adders;

accumulating the compared signals from said four adjacent comparison means in a bias accumulator to provide a continuous adaptive corrective signal therefrom wherein the rate of accumulating is controlled by the average difference in the median of the four adjacent compared signals and a median selected over the same interval; and

applying said adaptive corrective signal to a second input of said adder for combining with the generated uncorrected detector output to produce a corrected output signal which is continuously produced by said adder to said readout means and to said signal comparison means and said bias accumulator for providing pseudo DC restore application to said staring array detector system.

4,400,730

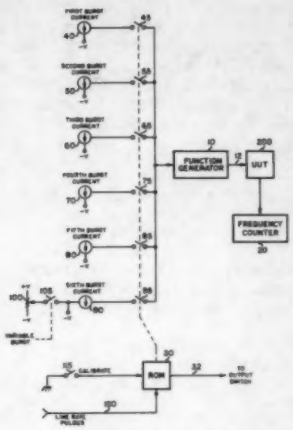
MULTIBURST SIGNAL GENERATION

David J. Jurgensen, Gaston, and Howard A. Landsman, Beaverton, both of Oreg., assignors to Tektronix, Inc., Beaverton, Oreg.

Continuation of Ser. No. 945,730, Sep. 25, 1978, abandoned. This application Jan. 23, 1981, Ser. No. 227,868

Int. Cl.³ H04N *7/02*

U.S. Cl. 358—139 **9 Claims**



1. A signal generator adapted for testing video circuitry, comprising

means for generating sine wave signals at a frequency dependent on a current level supplied thereto,

means for supplying current to said generating means, said means being operable in a first mode to supply a plurality of different, discrete current levels in a repeating sequence, and in a second mode to supply a continuous, adjustable level current, and

means for switching said current supplying means between said first and second modes.

4,400,731

TESTING DISPLAY SYSTEMS

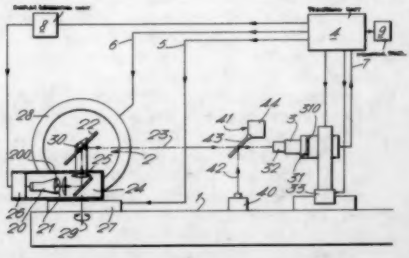
Richard Brown, Shipton Oliffe, England, assignor to Smiths Industries Public Limited Company, London, England

Filed Mar. 3, 1981, Ser. No. 239,932

Claims priority, application United Kingdom, Mar. 6, 1980, 8007717

Int. Cl.³ H04N *7/18*

U.S. Cl. 358—139 **9 Claims**



1. In apparatus for determining the disposition of a display representation in a display area of a display system of the kind

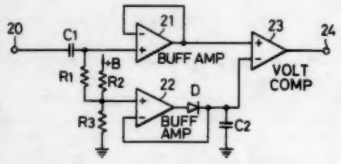
including means supplying signals to affect the disposition of said display representation, the improvement wherein the apparatus includes a camera of the kind including an array of radiation-responsive elements, mounting means mounting said camera to view said display area, the camera deriving an indication of the disposition of said display representation, processing means comparing the disposition of said display representation as derived from said camera with said signals supplied to said display system thereby to derive an indication of the difference between the signalled disposition and the actual disposition of said display representation, a source of known brightness, and means for imaging radiation from said source onto said array, said processing means comparing the output from an individual one of said elements when illuminated by radiation from said display area with the output when illuminated by radiation from said source.

4,400,732

PCM SIGNAL EXTRACTING CIRCUIT

Yasuaki Watanabe, Kasukabe, and Kenji Kaneko, Iwai, both of Japan, assignors to Victor Company of Japan, Kanagawa, Japan

Filed Dec. 18, 1981, Ser. No. 332,157
Claims priority, application Japan, Dec. 22, 1980, 55/181575
Int. Cl.³ H04N *7/08*
U.S. Cl. 358—147 **6 Claims**



1. A PCM signal extracting circuit comprising:

a highpass filter for separating a PCM signal, of a type not including a DC component, inserted between horizontal synchronizing signals within a predetermined interval of a composite video signal or a signal based on the composite video signal, and for obtaining an average DC level of said horizontal synchronizing signal and the PCM signal;

an attenuation circuit for attenuating an output signal of said highpass filter by a predetermined quantity according to the modulation factor of said PCM signal;

a holding circuit for holding a peak value, at the opposite side from the horizontal synchronizing signal, of the signal attenuated by said attenuation circuit; and

a level comparing circuit for comparing the levels of output signals of said highpass filter and said holding circuit, and extracting a signal obtained by slicing the output signal of said highpass filter by the level of the output signal of said holding circuit,

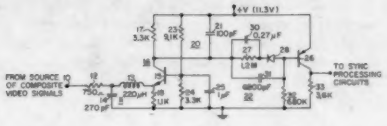
said attenuation circuit attenuating said PCM signal so that the level of the peak value, at the opposite side from the horizontal synchronizing signal, of said attenuated PCM signal, is equal to a level shifted towards a side opposite from the horizontal synchronizing signal by kx% from an average DC level of said PCM signal before attenuation, where k is a constant, and a distance between the average DC level of the PCM signal and the peak value of said PCM signal at the opposite side from the horizontal synchronizing signal is designated by x% where the distance between the pedestal of the horizontal synchronizing signal and the white peak level is expressed as 100%.

4,400,733

SYNCHRONIZING PULSE SEPARATOR

Thomas D. Yost, Indianapolis, Ind., assignor to RCA Corporation, New York, N.Y.

Filed May 8, 1981, Ser. No. 261,446
Int. Cl.³ H04N *5/08*
U.S. Cl. 358—155 **9 Claims**



1. In a television receiver incorporating means for providing a composite video signal including a picture luminance signal and a horizontal synchronizing pulse, means for separating said horizontal synchronizing pulse from said composite video signal in the presence of noise, comprising:

a first low pass filter responsive to said video signal for substantially attenuating said noise without substantially attenuating said synchronizing pulse;

an amplifier coupled to said low pass filter for amplifying a portion of the output signal from said low pass filter;

a second low pass filter responsive to said amplifier output for further attenuating said noise signal; and

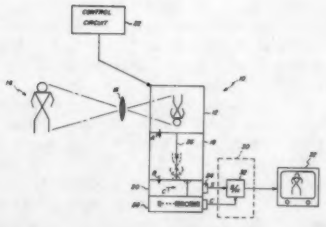
means coupled to said second low pass filter for providing a separated horizontal synchronizing signal when the output signal from said second low pass filter reaches an amplitude indicative of the presence of said horizontal synchronizing pulse within said composite video signal.

4,400,734

COLUMN DEFECT COMPENSATING APPARATUS FOR CCD IMAGE SENSOR

Lee N. Davy, Rochester, N.Y., assignor to Eastman Kodak Company, Rochester, N.Y.

Filed Oct. 28, 1981, Ser. No. 315,762
Int. Cl.³ H04N *5/14, 3/15*
U.S. Cl. 358—163 **3 Claims**



1. Column defect compensating apparatus for a charge coupled device (CCD) image sensor of the type having a two-dimensional array comprising rows and columns of charge transfer elements, and an output CCD shift register arranged across one end of the columns and adapted to receive in parallel, one row of charge packets and to deliver the charge packets serially under control of clock signals to an output location, the column defect compensating apparatus comprising:

auxiliary CCD shift register means having a plurality of cells corresponding to the columns of the two-dimensional array for producing signals representing the condition of said columns;

means for applying said clock signals to said auxiliary shift register means to produce said condition representative signals in synchronism with the delivery of the charge packets in the output shift register to the output location;

programable input means for inserting, in parallel, into said

auxiliary shift register, signals representing the condition of the columns of the array; said programable input means comprising (1) diode means disposed adjacent said cells of said auxiliary shift register for providing a source of signal charge, (2) gate means disposed between said diode means and said cells for selectively isolating said diode means from said cells, and (3) selectively destructible conductor means for controlling the transfer of charge from said diode means past said gate to said cells; and

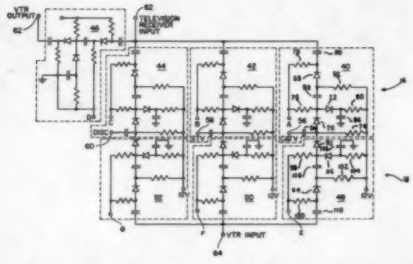
signal processing circuit means responsive to the signals the said auxiliary shift register for compensating for the column defects in the output of the image sensor.

4,400,735

MULTI-COMPONENT VIDEO SYSTEM CONTROLLER

Peter Strammello, Jr., Arlington Heights, Ill., assignor to Zenith Radio Corporation, Glenview, Ill.

Filed Jul. 10, 1981, Ser. No. 282,305
Int. Cl.³ H04N 5/22
U.S. Cl. 358—181 **10 Claims**



1. In a system having a single television receiver capable of receiving transmitted video signals in a plurality of broadcast bands, a source of external video signals and a video signal recorder for recording video signals thereon, a controller for the selective display on said television receiver of said transmitted, external or recorded video signals and the selective recording on said video signal recorder of said transmitted, or external video signals, said controller comprising:

a first plurality of user selectable control means for providing first control signals for the selective display on said television receiver of said transmitted, external or recorded video signals;

a second plurality of user selectable control means for providing second control signals for the selective recording on said video signal recorder of said transmitted or external video signals;

a plurality of input terminals for receiving said transmitted, external and recorded video signals;

a plurality of output terminals for providing said transmitted, external or recorded video signals to said television receiver for display thereon and for providing said transmitted or external video signals to said video recorder for recording thereon; and

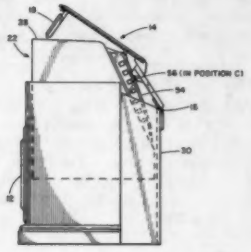
a plurality of first logic conducting means coupling each input terminal to an output terminal connected to said television receiver and a plurality of second logic conducting means coupling each input terminal to an output terminal connected to said video signal recorder, with said first logic conducting means coupled to and responsive to signals received from said first plurality of user selectable control means and said second logic conducting means coupled to and responsive to signals received from said second plurality of user selectable control means such that corresponding first and second logic conducting means coupled to the same input terminal are rendered in opposite conducting states by means of said first and second control signals when the video signals provided to said input terminal are displayed on said television receiver or recorded on said video signal recorder in eliminating video signal losses due to signal splitting.

4,400,736

LID RAISING MEANS FOR A JACK-IN-THE-BOX PROJECTION TELEVISION RECEIVER

Gary R. Weiss, Highland Park, Ill., assignor to Zenith Radio Corporation, Glenview, Ill.

Filed Jun. 26, 1981, Ser. No. 277,493
Int. Cl.³ H04N 5/64
U.S. Cl. 358—254 **3 Claims**



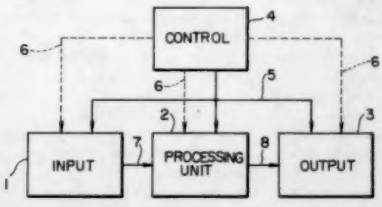
1. Lid-raising means for use in an ultra-compact, jack-in-the-box, rear-projection television receiver housed in an open-topped cabinet having lid means pivotally attached at the back thereof for selectively opening and closing said cabinet for emergence and storage of a unitary optical assembly elevatable from and nestable within said cabinet by precision elevating means, said unitary optical assembly including rear-projection screen means for displaying a television image upon said emergence, said unitary optical assembly including rigid, box-like shroud means having an open front for receiving and supporting said screen means, said lid-raising means comprising a cam assembly including at least one cam element and one captivated cam-follower element for slidably attaching said lid means to said shroud means such that as said unitary optical assembly is elevated and lowered by said precision elevating means, said lid-raising means is effective to raise and lower said lid in relatively friction-free sliding association while holding said lid means apart from rubbing contact with said shroud means.

4,400,737

APPARATUS FOR PRODUCING AND REPRODUCING EMBEDDED PATTERN

Yoshio Arai; Hiroyuki Kataoka; Isao Suzuki, and Satoru Itoh, all of Kanagawa, Japan, assignors to Fuji Xerox Co., Ltd., Tokyo, Japan

Filed Jul. 8, 1981, Ser. No. 281,261
Int. Cl.³ H04N 1/00
U.S. Cl. 358—263 **15 Claims**



1. An apparatus for producing a format with an embedded pattern comprising:

an input unit for reading normal original image patterns in accordance with a raster scanning system;

a processing unit having gate means for receiving an input signal from said input unit and means for controlling said gate means to prevent data of the input signal corresponding to a first plurality of predetermined positions at repeated intervals of a pattern being read by said input unit from passing through said gate means and to permit data of the input signal corresponding to a second plurality of predetermined positions interleaved with said positions of said first plurality of positions to pass through said gate means; and

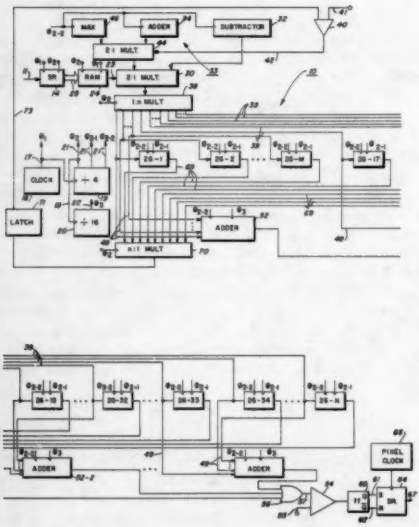
an output unit for recording an image by the same raster scanning system as said raster scanning system in accordance with an output from said processing unit.

4,400,738

IMAGE SIGNAL PROCESSING METHOD AND APPARATUS

Ronald S. Tomory, and James M. Odorczyk, both of Webster, N.Y., assignors to Xerox Corporation, Stamford, Conn.

Filed Oct. 30, 1981, Ser. No. 316,626
Int. Cl.³ H04N 1/40
U.S. Cl. 358—283 **11 Claims**



1. A method of processing image pixels line by line to enhance distinctions between halftone and text images, comprising the steps of:

(a) performing an initial distinction between halftone and text images by addressing a memory having predetermined halftone and text relationships stored therein with successive groups of said image pixels to provide halftone and text signals;

(b) generating a count signal in accordance with said halftone and text signals for each group of image pixels;

(c) providing a preset count in response to said count signal for each group of image pixels;

(d) summing a predetermined number of said preset counts to provide a total count;

(e) comparing said total count with a predetermined fixed threshold to provide an enhanced control signal identifying the presence of either halftone or text images; and

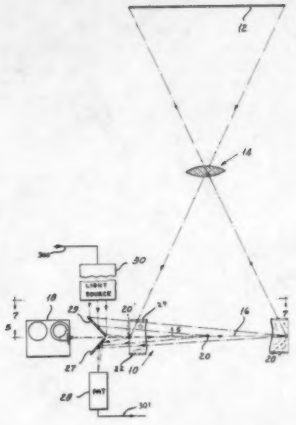
(f) operating an image generator to output halftone or text image signals in response to said enhanced control signal.

4,400,739

MICROBALLISTIC FACSIMILE SCANNER AND RECORDER

Benzion Landa, Edmonton, Canada, assignor to Savin Corporation, Valhalla, N.Y.

Filed May 27, 1981, Ser. No. 267,674
Int. Cl.³ H04N 1/10
U.S. Cl. 358—293 **14 Claims**



1. Apparatus for recording a facsimile signal including in combination means for illuminating a predetermined path, means responsive to said facsimile signal for modulating the light from said illuminating means, a plurality of projectiles adapted to divert from their direction of incidence rays of light impinging thereon, means for successively propelling said projectiles along said path in timed relation with said facsimile signal to produce corresponding patterns of light from said projectiles along said path, and means for forming an optical image of said patterns on successive portions of a recording medium.

4,400,740

INTENSITY CONTROL FOR RASTER OUTPUT SCANNERS

James C. Traino, Fairport; Felice A. Micco, Rochester, and Douglas L. Keene, New City, all of N.Y., assignors to Xerox Corporation, Stamford, Conn.

Filed Aug. 24, 1981, Ser. No. 295,438
Int. Cl.³ H04N 1/30
U.S. Cl. 358—293 **6 Claims**

1. In a raster output scanner, the combination of:

a high intensity beam of electromagnetic radiation;

means to scan said beam across a photoreceptor to expose said photoreceptor and create latent electrostatic images thereon;

modulator means for modulating said beam in response to control signals, said modulator means having a single port for receiving said control signals;

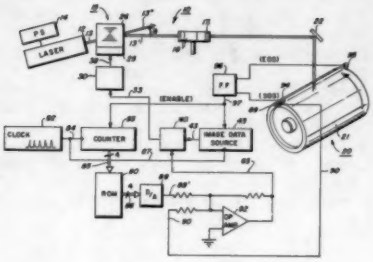
a source of video image signals;

a source of beam intensity signals; and

means for combining said video image signals with said beam intensity signals to provide said control signals for input to said modulator means port whereby said modulator means beams and modulates both on and off of said beam intensity in accordance with said video image sig-

nals and said beam intensity signals, said source of beam intensity signals including

means providing a first corrective signal reflecting changes in intensity of said beam as said beam scans across said photoreceptor;



means providing a second corrective signal reflecting current beam intensity as said beam scans across said photoreceptor;

and means for combining said first and second corrective signals to provide said beam intensity signals.

4,400,741

VIDEO TAPE RECORDER WITH INTER-CHANNEL SWITCHING CIRCUIT FOR SPECIAL MODES OF REPRODUCTION

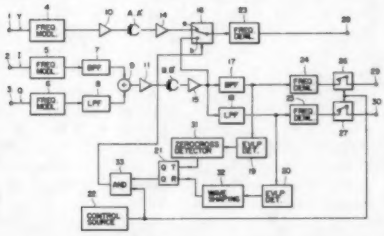
Kunio Sekimoto, Katano; Katsuhiko Yamamoto, Neyagawa; Chojuro Yamamitsu, Kawanishi, and Kozo Kurashina, Yahata, all of Japan, assignors to Matsushita Electric Industrial Company, Limited, Osaka, Japan

Filed Apr. 14, 1981, Ser. No. 254,186

Claims priority, application Japan, Apr. 15, 1980, 55-49715

Int. Cl.³ H04N *9/491, 5/78*

U.S. Cl. 358—312 **10 Claims**



1. A video tape recording and reproducing apparatus having first and second transducer heads adapted to receive first and second input recording signals respectively and mounted on the circumference of a rotary cylinder normally driven at a speed having a predetermined relationship with the speed of movement of the recording tape during recording, the recording signals being recorded along alternate tracks skewed relative to the length of the tape, said cylinder being drivable during a slow-motion playback mode or the like for scanning the skewed tracks on the tape at a manually selectable speed different from the speed at which said rotary cylinder is normally driven during recording of said signals, thereby causing said transducer heads to traverse several tracks for each line scan of said tape by said transducer heads and producing unwanted signals having a sharply transitory waveform, comprising detecting means for detecting a transitory point of said waveform and generating therefrom a control signal, and coupling means responsive to said control signal for selectively coupling one of a plurality of playback signals derived from said first and second transducer heads to a utlilization circuit.

4,400,742

MAGNETIC RECORDING AND REPRODUCING APPARATUS FOR COLOR VIDEO SIGNALS

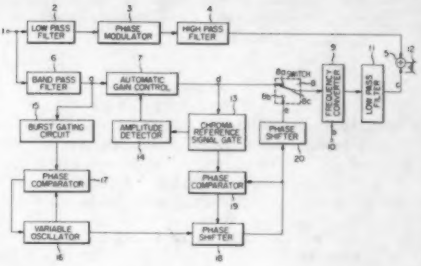
Chojuro Yamamitsu, Kawanishi; Ichiro Arimura, Kyoto, and Masamitsu Ohtsu, Kadoma, all of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka, Japan

Continuation of Ser. No. 944,388, Sep. 21, 1978, abandoned. This application May 29, 1980, Ser. No. 154,454

Claims priority, application Japan, Sep. 26, 1977, 52-115781

Int. Cl.³ H04N *5/79*

U.S. Cl. 358—318 **4 Claims**



1. A magnetic recording and reproducing apparatus for recording and reproducing a color television signal containing a VIR signal, comprising:

means for separating the color burst signal component and the normal chroma reference signal to be recorded;

means for correcting any transmission distortions in amplitude and/or phase of the carrier color signal portion of said color television signal having said VIR signal components separated therefrom, to provide a corrected color television signal;

means for recording said corrected color television signal;

means for reproducing said recorded color television signal, the reproduced signal including an abnormal chroma reference signal component; and

means operatively associated with said reproducing means for providing the reproduced color television signal with a corrected chroma reference signal comprising the color burst signal constituent of the carrier color signal portion of said reproduced color television signal by substituting the normal chroma reference signal component for the abnormal chroma reference signal component of said reproduced color television signal.

4,400,743

VIDEO CAMERA AND RECORDER

Hiroyuki Takimoto, Yokohama, and Tatsuzo Ushiro, Tokyo, both of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Dec. 31, 1980, Ser. No. 221,787

Claims priority, application Japan, Jan. 16, 1980, 55-3142[U]

Int. Cl.³ H04N *5/91*

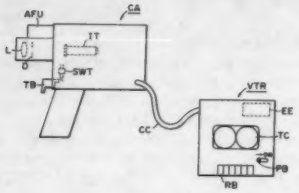
U.S. Cl. 358—335 **18 Claims**

1. A video camera for use with a video recorder having means for recording video signals on a recording medium and being operable to start the recording operation in response to a start signal provided by the camera, said camera comprising:

a focus adjustable image pick-up lens system;

an automatic focusing device for automatically adjusting the focus of said lens system onto an object, said focusing device producing a characteristic output upon completion of the focusing of the lens system onto the object;

trigger means operable manually from outside of the camera; and



means responsive to the operation of said trigger means and to the characteristic output of said focusing device to produce said start signal for causing said video recorder to start the recording operation.

4,400,744

CASSETTE TAPE PLAYER

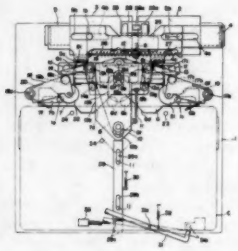
Teturo Kamimura; Masahiro Komatsubara; Shizuo Ando; Takuzi Inanaga, and Akira Takahashi, all of Kawagoe, Japan, assignors to Pioneer Electronic Corporation, Tokyo, Japan

Filed Mar. 20, 1981, Ser. No. 245,931

Claims priority, application Japan, Mar. 31, 1980, 55-42676[U]

Int. Cl.³ G11B *15/18, 17/00, 19/02*

U.S. Cl. 360—69 **4 Claims**



1. A cassette tape player comprising:

a chassis;

a head base adapted to take a retracted position and an advanced position relative to a loaded cassette;

probe means for detecting a chrome tape indicating aperture formed in said loaded cassette, said probe means being normally urged into engagement with said aperture;

control means coupling said head base and said probe means for holding said probe means out of engagement with said aperture while said head base takes the retracted position; and

switch means for turning on an electric circuit for a chrome tape by the probe means being urged into engagement with the chrome tape indicating aperture.

4,400,745

TAPE TRANSPORT

Stephen K. Shu, Fountain Valley, Calif., assignor to Del Mar Avionics, Irvine, Calif.

Filed Nov. 17, 1980, Ser. No. 207,626

Int. Cl.³ G11B *15/52, 15/43*

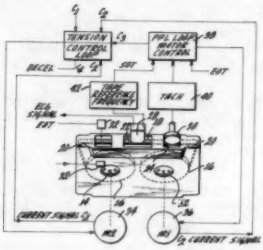
U.S. Cl. 360—73 **6 Claims**

1. An improvement in a capstanless magnetic tape transport for controlling the movement of the magnetic tape, said tape having a reference clock signal recorded thereon and a data signal simultaneously recorded thereon, a supply reel containing said magnetic tape, a take-up reel, said supply reel and take-up reels being coupled by magnetic tape connected therebetween for movement between said supply and take-up reels, means forming a pair of spaced hubs for supporting and turning each of said reels, a take-up variable speed motor connected to said take-up reel, a supply variable speed motor connected to said supply reel, said improvement comprising:

a current drive amplifier connected to each of said supply and take-up motors for supplying driving power to each motor;

a phase lock loop (PLL) servo means for controlling said take-up drive amplifier and including a PLL clock for generating a PLL clock signal;

a first tape reference input means connected to said PLL servo means, said first reference input means for measuring the speed of movement of said tape between said supply and take-up reels, said PLL servo means being responsive to said first tape reference means and connected thereto, said first tape reference means linearly



driving said PLL servo means from a start-up speed to a selected speed;

a second tape reference input means connected to said PLL servo means for reading said reference clock signal recorded on said magnetic tape and for controlling said PLL servo means so that the speed of said tape from said supply reel to said take-up reel is controlled so that said PLL clock signal and said reference clock signal on said magnetic tape are synchronized; and

tensioning means for providing a tape tension servo loop said tensioning means being responsive to said driving power supplied to said take-up and to said supply motors by said corresponding current drive amplifiers, and the output of said tensioning means connected to said supply reel drive amplifier whereby tension is supplied to said tape in response to a continuously varied speed during playback, and whereby said tape speed is continuously varied during playback to exactly cancel any speed variation which occurs during original recording.

4,400,746

APPARATUS FOR AND METHOD OF DETERMINING TRANSVERSE POSITION OF A TRANSDUCER HEAD RELATIVE TO READ DATA TRACKS

Jean Lequien, Les Ulis, France, assignor to CII Honeywell Bull, Paris, France

Filed Nov. 10, 1980, Ser. No. 205,863

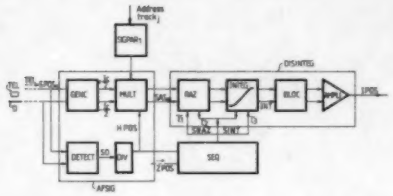
Claims priority, application France, Nov. 19, 1979, 79 28421

Int. Cl.³ G11B *21/10*

U.S. Cl. 360—77 **21 Claims**

1. A method of detecting the transverse position of a transducer head relative to a reference position defining a longitudinal axis between longitudinally extending adjacent tracks, each of said tracks including a plurality of longitudinally extending, equal length cells, like numbered cells of said tracks having aligned boundaries, said tracks being translated longitudinally relative to said transducer, said cells having physical variations and said transducer being responsive to the variations in the cells of both tracks so that the transducer derives a series of

sequential waveforms respectively having first and second like amplitudes and shapes for even and odd numbered cells as the tracks are translated relative to the head, the waveforms for each of the odd numbered cells including successive equal first amplitude pulses of first and second different polarities, the waveforms for each of the even numbered cells including successive equal second amplitude pulses of first and second different polarities, the number of pulses and the approximate shapes of the pulses for the even and odd numbered cells being



the same, the first and second amplitudes being indicative of the transverse position of the transducer relative to the axis, the method comprising responding to the waveforms so that both pulses of each odd numbered cell have one of the polarities and both pulses of each even numbered cell have the other polarity while substantially retaining the shape and amplitude of the pulses to derive a resulting waveform, and integrating the resulting waveform over an integral number of the cells to derive an indication of the transverse position.

4,400,747

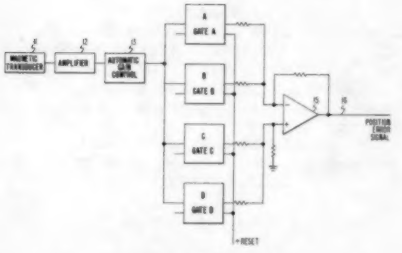
SERVO SYSTEM FOR DATA STORAGE APPARATUS

Michael M. Siverling, Rochester, Minn., assignor to International Business Machines Corporation, Armonk, N.Y.

Filed Jun. 26, 1981, Ser. No. 277,764

Int. Cl.³ G11B *21/10*

U.S. Cl. 360—77 **10 Claims**



1. In a data storage device of the type wherein a data track is aligned by locating a transducer with respect to the interface between adjoining servo tracks, a servo system for positioning a transducer means relative to a given data track comprising:

a sequence of at least four radially adjacent servo track portions;

a unique signal recorded in each of said four servo track portions;

analog sensing means including said transducer means for sensing the magnitude of signals received from each of said four servo track portions;

first circuit means for imparting a first signal strength value to the signals of the two of said servo track portions whose interface locates said data track and a second higher signal strength value to the signals of the servo track portions adjoining said two of said servo track portions, said signals from servo track portions at one side of said interface having one polarity and the signals from said servo track portions at the side opposite said one side having a polarity the opposite of said one polarity; and

second circuit means connected to the output of said first circuit means for determining the magnitude and polarity of the modified signal received from said first circuit means, whereby the magnitude of displacement and the direction of displacement of said transducer means from said interface is ascertained.

4,400,748

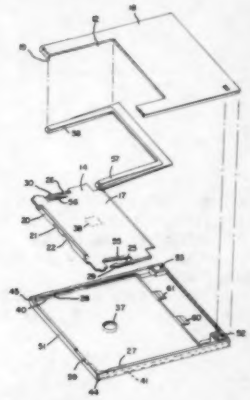
FLEXIBLE MAGNETIC DISK DRIVE USING A RIGID CARTRIDGE

Randall C. Bauck, Davis County; S. Peter Kleczkowski, and Anton J. Radman, both of Weber County, all of Utah, assignors to Iomega Corporation, Ogden, Utah

Filed Apr. 22, 1981, Ser. No. 256,320

Int. Cl.³ G11B *5/016*

U.S. Cl. 360—99 **17 Claims**



1. A magnetic disk cartridge for use with a disk drive of the type having a fixed Bernoulli plate against which a flexible magnetic disk is rotated in read/write relationship with a magnetic head, said cartridge comprising:

a rigid box containing said flexible magnetic disk, said box having an opening in one side thereof through which said disk is rotated in said read/write relationship; and

a slider which normally closes said opening, said slider being engaged by said plate when said cartridge is inserted into said drive to move said slider to an open position in which said disk is rotated in said read/write relationship.

4,400,749

CARRIER DEVICE FOR MAGNETIC-ELECTRIC TRANSDUCER ON A READ/WRITE UNIT OPERATING WITH MAGNETIC STORAGE PLATES

Konrad Franke, Schweitenkirchen, and Christoph Weber, Eching, both of Fed. Rep. of Germany, assignors to Woelke Magnetbandtechnik GmbH & Co. KG, Sweitenkirchen, Fed. Rep. of Germany

Filed Oct. 23, 1980, Ser. No. 199,756

Claims priority, application Fed. Rep. of Germany, Jul. 25, 1980, 3028256

Int. Cl.³ G11B *21/20, 5/54*

U.S. Cl. 360—104 **9 Claims**

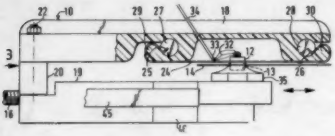
1. A carrier apparatus for magnetic reading and writing heads and the like which cooperate with a magnetic storage disc comprising:

support means;

a strip of flexible film material having opposite ends secured to the support means and tensioned lengthwise; the longi-

tudinal direction of said film strip lying radially of said disc in the operative arrangement;

aperture means in said film strip for providing at least one tension relieved area of said film strip;



at least one magnetic head mounted on said film in said tension relieved area; and

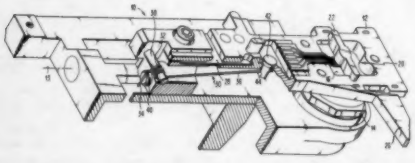
conductor means bonded to said film and extending from said tension relieved area to a terminal area.

4,400,750

SPRING LOADING ARRANGEMENT IN A MAGNETIC READ/WRITE HEAD CARRIAGE ASSEMBLY FOR A FLOPPY DISK DRIVE

Jan G. Krane, San Juan Capistrano, Calif., assignor to Forestlane Co., Ltd., Tustin, Calif.

Filed Sep. 25, 1981, Ser. No. 305,591
Int. Cl.³ G11B *5/48, 5/54, 17/32, 21/24*
U.S. Cl. 360—105 **2 Claims**



1. A magnetic read/write head carriage assembly for a data storage device fow use with a flexible, rotatable magnetic recording disk, said carriage assembly having a base and being movable in a radial direction relative to the recording disk, said carriage assembly comprising, in combination:

(a) a first magnetic head mounted on said base;

(b) a head support arm having first and second ends, said support arm being pivotally mounted at said first end thereof with respect to said base such that said second end thereof is movable toward and away from said first magnetic head;

(c) a second magnetic head mounted on said support arm at the second end thereof;

(d) spring means, having first and second ends, for biasing said second end of said support arm, and thereby said second magnetic head, toward said first magnetic head, said spring means being mounted in a position between said base and said support arm with said first end thereof being coupled to said base and said second end thereof being coupled to said support arm;

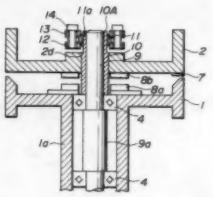
(e) an adjustment screw mounted in said base adjacent said first end of said spring means for adjusting the position of said first end of said spring means and thereby the biasing force applied to said support arm.

4,400,751

VIDEO HEAD DRUM FOR VIDEO TAPE RECORDERS

Tamotsu Tominaga, Akishima, Japan, assignor to Hitachi Denshi Kabushiki Kaisha, Tokyo, Japan

Filed Mar. 3, 1981, Ser. No. 239,207
Claims priority, application Japan, Mar. 6, 1980, 55-28199
Int. Cl.³ G11B *5/52;* **F16C** *7/04;* **G11B** *15/60, 21/18*
U.S. Cl. 360—107 **5 Claims**



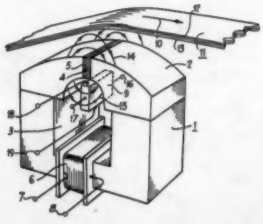
1. In a video head drum comprising a lower guide drum, a rotary head drum which is disposed coaxially with said lower guide drum and a rotary shaft which passes through the center of said lower guide drum and that of said rotary head drum and is fixed to said rotary head drum, the improvement comprising a cylindrical member fitted in the opening in the central portion of said rotary head drum, a ring member which is mounted on said cylindrical member, the cross section of said ring member in the rotating axial direction thereof including an outward bulge at the center, and a pair of ring-shaped plates, each having an inner diameter smaller than the maximum outer diameter of said ring member, said ring-shaped plates being fitted along the outer peripheral portion of said ring member in such a manner as to sandwich said bulge, said ring-shaped plates including means for fixing said rotary head drum to said rotary shaft, said means for fixing including means for drawing said ring-shaped plates in a direction which brings said ring-shaped plates closer to each other.

4,400,752

MAGNETO-ELECTRIC TRANSDUCER FOR A MAGNETIC RECORDING SYSTEM AND RECORDING SYSTEM COMPRISING SUCH A TRANSDUCER

Jacques Chabrolle, Bagnolet, France, assignor to LCC-CICE Compagnie Europeene de Composants Electroniques, Bagnolet, France

Filed Jul. 16, 1980, Ser. No. 169,353
Claims priority, application France, Jul. 20, 1979, 79 18811
Int. Cl.³ G11B *5/12, 5/22*
U.S. Cl. 360—112 **7 Claims**



1. A magneto-electric read/write transducer, comprising:

a magnetic circuit in the form of a flat ring having external and internal faces and a single non-magnetic gap therein, for producing (a) an external flux across the gap at its external face for interacting with a magnetizable support medium and (b) a leakage flux across the gap at its internal face;

a coil wound about the ring for inducing a flux in the magnetic circuit; and

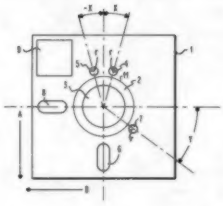
a magneto-sensitive element positioned internal of the ring substantially within a region that would be subjected to the leakage flux for generating an electrical signal responsive to the leakage flux in the magnetic circuit.

4,400,753

UNIVERSAL MAGNETIC RECORDING DISK CARTRIDGE

William E. Beebe, Round Rock, and Dean R. Duff, Austin, both of Tex., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Jun. 19, 1981, Ser. No. 275,543
Int. Cl.³ G11B 23/04
U.S. Cl. 360—133 3 Claims



1. In an information storage cartridge utilized in a disk drive including a rotary magnetic recording disk and cover containing said disk, the improvement comprising in combination:

a single orientation aperture in said disk located at a distance from the center of said disk;

a plurality of orientation apertures in said cover defined in a plane lying in substantially coplanar relation to said disk and located an equal distance from the center of said disk for defining the orientation of said disk in said disk drive for reading and recording information on said disk at a first or second recording density; and

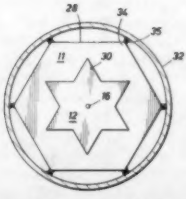
a plurality of pairs of transducer apertures in said cover for exposing the recording surface of said disk for reading and recording thereon, each pair of said transducer apertures associated with one or more of said orientation apertures for determining that the recording of information on said disk is on one side or both sides of said disk when said cartridge is inserted in said disk drive.

4,400,754

SPARK ARRESTOR

Karl Schweickardt, Cazenovia, N.Y., assignor to Esquire, Inc., New York, N.Y.

Filed Nov. 27, 1981, Ser. No. 325,563
Int. Cl.³ H02H 7/04, 9/04
U.S. Cl. 361—38 8 Claims



1. A spark arrestor for protecting a ballast connected to a high intensity, gaseous discharge lamp, comprising

a substrate disc of low dielectric material having substantially no capacitance,

a first side electrical conductive material affixed to a first side of said substrate disc,

a second side electrical conductive material affixed to a second side of said substrate disc,

said first side material and said second side material both being patterned on the substrate disc to include a plurality of points near the peripheral edge of said substrate, the points of the material on each side being respectively substantially aligned,

a first electrical terminal affixed to said first side material, and

a second electrical terminal affixed to said second side material,

said first terminal and said second terminal providing connection across the ballast,

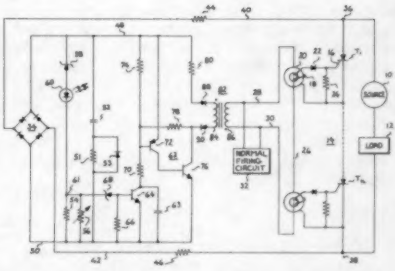
a large electrical charge between said first terminal and said second terminal discharging around the peripheral edge of the substrate disc from at least one point of said first side material to the corresponding point of said second side material.

4,400,755

OVERVOLTAGE PROTECTION CIRCUIT

Georges R. E. Lezan, Roanoke, Va., assignor to General Electric Company, Salem, Va.

Filed Jul. 16, 1981, Ser. No. 284,070
Int. Cl.³ H02H 3/20, 9/04
U.S. Cl. 361—91 9 Claims



1. An overvoltage protection circuit for a circuit array comprised of one or more semiconductor devices each having anode, cathode and gate electrodes, said array being connected intermediate a source of electrical power and a load and serving, upon the application of gating pulses to the gate electrodes, to deliver electrical power from the source to the load, said overvoltage protection circuit comprising:

(a) means to provide a unidirectional current proportional to the instantaneous voltage across the array;

(b) change storage means responsive to said unidirectional current to develop an electrical charge of a predetermined magnitude;

(c) means responsive to said unidirectional current to develop a signal proportional to the instantaneous voltage across the array; and,

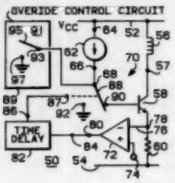
(d) switch means, responsive to said signal, operative to discharge said charge storage means to thereby develop a firing signal for rendering each device of the array conductive.

4,400,756

INDUCTIVE LOAD DRIVER PROTECTION CIRCUITS HAVING MINIMAL POWER DISSIPATION

David L. Cave, Tempe, Ariz.; Gary L. Maulding, Palm Bay, Fla., and Howard F. Weber, Scottsdale, Ariz., assignors to Motorola, Inc., Schaumburg, Ill.

Filed Aug. 27, 1981, Ser. No. 296,674
Int. Cl.³ H01H 47/32
U.S. Cl. 361—152 4 Claims



1. A circuit for limiting current in an inductive load, comprising:

a transistor having first and second current conducting electrodes and a control electrode, said first current conducting electrode coupled to said load;

current sensing means coupled between said second current conducting electrode and a first reference voltage, said current sensing means having a sensed voltage;

comparator means having a first input adapted to receive a bias voltage, a second input coupled to said current sensing means, and an output having a first state representative of said sensed voltage being greater than said bias voltage and a second state representative of said sense voltage being less than said bias voltage;

control circuit means having a control terminal responsive to said output of said comparator means and having an output coupled to said control electrode for rendering said transistor nonconductive when said output of said comparator means is in said first state and for rendering said transistor conductive when said output of said comparator means is in said second state; and

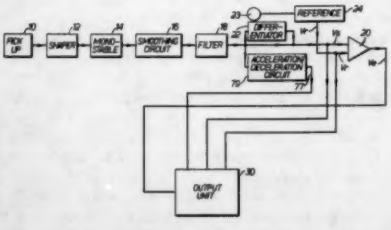
time delay means coupled between said output of said comparator means and said control circuit means for disabling said transistor for a predetermined period of time following the transition at said output of said comparator means from said second state to said first state.

4,400,757

AUTOMATIC SPEED CONTROL SYSTEMS

Kenneth B. Caldwell, Rugby, England, assignor to Associated Engineering Limited, Rugby, England

Filed Jul. 21, 1981, Ser. No. 285,632
Claims priority, application United Kingdom, Aug. 10, 1980, 8025883
Int. Cl.³ G05D 13/62
U.S. Cl. 361—236 9 Claims



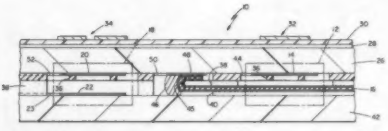
1. An automatic speed control system for controlling the speed of a vehicle, comprising comparing means for comparing signals respectively representing the actual and desired speeds of the vehicle so as to produce an error signal having a sign and magnitude dependent on the sign and magnitude of the speed error (if any) between them, output means responsive to the error signal and capable of producing a first or a second control output according as to whether the actual vehicle speed is greater or less than the desired speed, speed correcting means operative to produce a speed correction in dependence on the magnitude of the control output received so as to tend to reduce the speed error to zero, and modifying means operative after the speed error has changed sign to modify at least one said control output whereby to provide a temporary change in the mean level of that control output.

4,400,758

CAPACITANCE SWITCH ARRANGEMENT

Norman J. Frame, Whitefish Bay, Wis., assignor to W. H. Brady Co., Milwaukee, Wis.

Filed Jun. 29, 1981, Ser. No. 278,658
Int. Cl.³ H01G 5/16
U.S. Cl. 361—290 8 Claims



1. A capacitance switch comprising

a substrate,

a first conductive contact carried by said substrate,

a flexible sheet extending over said substrate,

a second conductive contact carried by said flexible sheet and aligned with and ordinarily spaced from said first contact,

a capacitance spacing element carried by one of said substrate and said flexible sheet, located other than directly under or above said contacts,

said capacitance spacing element comprising

an inner insulating layer and

outer conductive portions, one said conductive portion being electrically connected to one said contact, and

first means for connection of the other said contact and the other said conductive portion to external circuitry,

whereby said flexible sheet may be flexed to vary the spacing between said contacts to increase the capacitance of said switch.

4,400,759

DIELECTRIC CERAMIC COMPOSITION HAVING A BASE OF BARIUM TITANATE, LITHIUM OXIDE AND CUPRIC FLUORIDE, A CAPACITOR IN WHICH A COMPOSITION OF THIS TYPE IS EMPLOYED, AND A METHOD OF PRODUCTION OF SAID COMPOSITION

Alain Lagrange, and Alain Beauger, both of Bagnolet, France, assignors to LCC-CICE-Compagnie Europeenne de Composants Electroniques, Bagnolet, France

Filed May 25, 1982, Ser. No. 381,833
Claims priority, application France, May 26, 1981, 81 10457
Int. Cl.³ C04B 35/46
U.S. Cl. 361—321 5 Claims

1. A ceramic consisting essentially of a dielectric composition having 90% to 98% by weight of barium titanate and the balance being, 0.5% to 2.5% by weight of lithium oxide and 1.5% to 8% by weight of cupric fluoride wherein molar ratio of TiO_2/BaO in said barium titanate is higher than or equal to 0.97 and lower than or equal to 0.98.

4. An electric capacitor comprising at least one dielectric

layer covered by a conductive metal plate, wherein the dielectric layer is constituted by a composition according to claim 1.

4,400,760

DIELECTRIC CERAMIC COMPOSITION HAVING A BASE OF BARIUM TITANATE, LITHIUM OXIDE AND CADMIUM FLUORIDE, A CAPACITOR IN WHICH A COMPOSITION OF THIS TYPE IS EMPLOYED, AND A METHOD OF PRODUCTION OF SAID COMPOSITION

Alain Lagrange, and Alain Beauger, both of Bagnolet, France, assignors to LCC.CICE - Compagnie Europeenne de Composants Electroniques, Bagnolet, France

Filed May 25, 1982, Ser. No. 381,834
Claims priority, application France, May 26, 1981, 81 10456
Int. Cl.³ C04B *35/46*
U.S. Cl. 361—321 5 Claims

1. A ceramic consisting essentially of a dielectric composition having 85% to 97% by weight of barium titanate and the balance being, 0.5% to 2.5% by weight of lithium oxide and 2.5% to 12% by weight of cadmium fluoride wherein molar ratio of TiO_2/BaO in said barium titanate is higher than or equal to 0.97 and lower than or equal to 0.98.

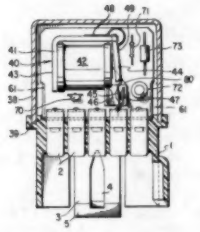
4. An electric capacitor comprising at least one dielectric layer covered by conductive metal plates, wherein the dielectric layer is constituted by a composition according to claim 1.

4,400,761

COMPACT RELAY SYSTEM

Rodney Hayden, Stoney Creek, and Mario Guarasci, Niagara Falls, both of Canada, assignors to TRW Inc., Cleveland, Ohio

Filed Feb. 8, 1982, Ser. No. 346,456
Claims priority, application Canada, Jun. 12, 1981, 379619
Int. Cl.³ H05K *7/02, 7/06;* H01H *47/04*
U.S. Cl. 361—400 16 Claims



1. An improved relay assembly which comprises, a relay, a circuit board, and a base,

said relay comprising a magnetic yoke, a bobbin mounted on said yoke, an ear extending from said bobbin, a winding wound on said bobbin, armature means mounted to said yoke carrying first contact means, second contact means housed within said ear for engagement by said first contact means, said relay having connector means extending from said contact means and protruding to a chosen one side of said relay for insertion into one side of said circuit board,

said circuit board comprising conductive cladding on the other side of said board, said connector means extending through said circuit board and being connected to said cladding, said cladding providing chosen interconnecting circuitry for said relay, and

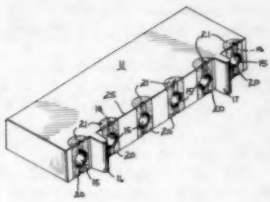
a plurality of terminals arranged at one edge of said board each terminal having a part extending through a respective slot defined in said board and connected to said cladding for effecting individual circuit connections from each of said terminals to said interconnecting circuitry, each of said terminals also being received in a respective slot in the base and resiliently retained in said respective slot by engagement of said terminal with the material of said base, said terminals providing accessible connecting means at said base for electrical connection to said interconnecting circuitry for operation of said relay.

4,400,762

EDGE TERMINATION FOR AN ELECTRICAL CIRCUIT DEVICE

John E. Bartley, Greenfield, Wis., and Orville R. Penrod, Kernersville, N.C., assignors to Allen-Bradley Company, Milwaukee, Wis.

Continuation of Ser. No. 181,329, Aug. 25, 1980, abandoned.
This application Jun. 28, 1982, Ser. No. 392,921
Int. Cl.³ H05K *1/16*
U.S. Cl. 361—402 4 Claims



1. In an electrical circuit device including a substrate of electrically insulating material having a first planar surface upon which is disposed an electrical circuit component; an adjoining second generally planar surface angularly disposed relative to said first planar surface; said planar surfaces conjointly defining a line of intersection therebetween; an aperture extending inwardly from said second planar surface and having its entrance opening solely confined to said second planar surface; a terminal lead having a portion thereof seated within said aperture and having its remaining portion extending outwardly from said entrance opening; a conducting edge termination coating deposited transversely of said second planar surface and extending from said aperture over said line of intersection and onto said first planar surface to provide a continuous path between said electrical circuit component and said terminal lead; and a layer of conducting solder deposited on said edge termination coating: the combination therewith of a continuous groove formed in the second planar surface of said substrate, said groove having one end communicating with said aperture and having its opposite end traversing said line of intersection to conjointly communicate with each of said first and second planar surfaces and underlying said deposited edge termination coating; whereby an uninterrupted conducting path of solder and its underlying edge termination coating extends from said lead to connect with said electrical circuit component.

4,400,763

PORTABLE LIGHT

David E. Kribs, P.O. Box 67, Haines City, Fla. 33844, and Robert Burton, Park Ridge, N.J., assignors to David E. Kribs, Haines City, Fla.

Filed Nov. 9, 1981, Ser. No. 319,118
Int. Cl.³ F21L *15/08*
U.S. Cl. 362—103 7 Claims

1. A portable light comprising:

a box-shaped housing having a rectangular front opening;

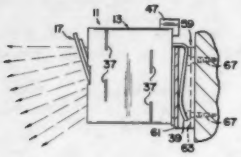
a battery disposed in said housing;

means disposed on said housing for supporting said battery;

a rectangular front plate member disposed within said rectangular front opening and pivotally connected to said housing;

a truncated conical reflector including a circlar opening

therein, said conical reflector being attached to said rectangular front plate member;
an incandescent lamp disposed in said circular opening and in fixed relation to said reflector;
a switch movably disposed at the top of said housing, said



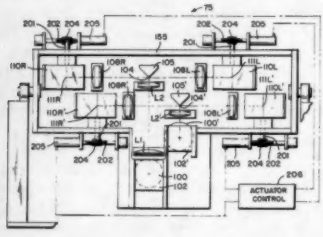
switch being operatively connected to said battery and said incandescent lamp to regulate the flow of electricity thereto;
a plurality of L-shaped members formed on the sides of said housing; and
a clip connector attached to the rear of said housing.

4,400,764

LOW BACKSCATTER ILLUMINATION SYSTEM

Bruce A. Kenyon, Sumner, Wash., assignor to The Boeing Company, Seattle, Wash.

Continuation-in-part of Ser. No. 118,662, Feb. 5, 1980, abandoned. This application May 19, 1981, Ser. No. 265,097
Int. Cl.³ F21V *9/00*
U.S. Cl. 362—263 **39 Claims**



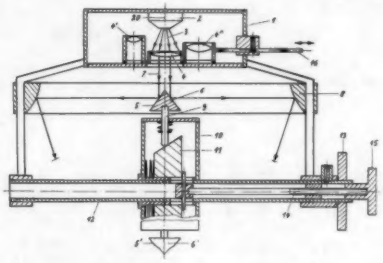
1. The method of forming an illuminating beam characterized by the absence of light in the space above a horizontal plane containing the optical axes of an optical system of the type having an entrance pupil, first and second exit pupils generally located on parallel optical axes, an image splitting reflecting prism, and a series of imaging and collimating lenses, comprising the steps of:
(a) forming a collimated light beam;
(b) projecting the collimated light beam through an aperture comprising the entrance pupil of the optical system;
(c) imaging the collimated light beam at the apex of the image splitting reflecting prism with the axis of the beam being coincident with the prism apex so as to split the distribution image of the beam into first and second generally equal halves directed in generally opposite directions by reflection from the prism and with the respective halves of the distribution image being disposed in the upper halves of the focal planes of respective ones of first and second collimating lenses;
(d) collimating and inverting the respective halves of the distribution image by directing the light in the upper halves of the focal planes of the first and second collimating lenses through the lenses and towards respective ones of the first and second exit pupils of the optical system; and,
(e) directing the collimated beams exiting from the first and second exit pupils along generally parallel optical axes to form an illuminating beam having a broad forward aspect and essentially devoid of light in the space above a generally horizontal plane passing through the optical axes of the system.

4,400,765

OPERATING ROOM LIGHT FIXTURE WITH ADJUSTABLE LIGHT PATTERN

Winfried Kochem, Ransbach-Baumbach, Fed. Rep. of Germany, assignor to Original Hanau Heraeus GmbH, Hanau, Fed. Rep. of Germany

Filed Feb. 18, 1981, Ser. No. 235,695
Claims priority, application Fed. Rep. of Germany, Mar. 29, 1980, 3012340
Int. Cl.³ F21V *7/16*
U.S. Cl. 362—277 **12 Claims**



1. Operating room light fixture with adjustable light distribution pattern having
a support structure (**1**);
a ring reflector (**8**) located on the support structure;
a cone reflector means (**6**) located centrally within the ring reflector (**8**);
light directing means (**2, 3, 4**) directing a beam of light (**3, 7**) on said cone reflector along the central axis (**20**) thereof for reflection from an essentially conical surface (**5, 5'**) to the ring reflector (**8**) and subsequent reflection to a surface (**17**) to be illuminated; and
comprising, in accordance with the invention,
a plurality of reflecting bodies (**6, 6'**) forming the cone reflector means and having, respectively, different reflecting surfaces (**5, 5'**) of different reflection characteristics or geometry positioned on said structure;
and means for interchangeably positioning a selected one of the plurality of cone bodies (**6, 6'**) in the path of the beam of light for interchange of a reflecting surface with another reflecting surface of different reflection characteristics or geometry.

4,400,766

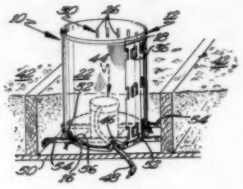
INSULATION DAMMING DEVICE

Richard W. Munson, Minnetonka, Minn., assignor to Low Energy Homes, Inc., Minnetonka, Minn.

Filed Jan. 5, 1981, Ser. No. 222,465
Int. Cl.³ F21V *15/00*
U.S. Cl. 362—376 **8 Claims**

1. Device for damming insulation around and away from a heat producing object, such as a recessed light fixture, and for preventing the insulation from contacting the heat producing object, comprising, in combination: an insulation damming member formed of generally planar sheet metal and having a top edge, a bottom edge, a first end edge, a second end edge, a first surface, and a second surface, with the height of the damming member being defined by the distance between the top edge and the bottom edge, with the damming member having

a standard sold length defined by the distance between the first end edge and the second end edge; a top series of slots located adjacent the top edge of the damming member; a bottom series of slots located adjacent the bottom edge of the damming member; a middle series of slots located midway between the top and bottom edges of the damming member, with the top, bottom, and middle series of slots formed through the first and second surfaces of the damming member and extending along a length of the damming member from the second end edge; a top extension member associated with the top series of slots and extending from the first end edge of the damming member; a bottom extension member associated with the bottom series of slots and extending from the first end edge of the damming member; a middle extension member associated with middle series of slots and extending from the first end edge of the



damming member, with the top, bottom, and middle extension members being interconnectable to the slots in a positive belt loop, finger locking type interconnection wherein the extension members may be inserted in one of the slots of the series of slots and passed through and hooked around the adjacent slot in the series of slots to form the damming member into an enclosure of a size to fit around the heat producing object without the necessity of tools or without cutting the damming member and allowing the perimeter of the enclosure to be substantially equal to the length of the damming member or less than the length of the damming member whereby the damming member can be easily and quickly formed into an enclosure having a perimeter less than or substantially equal to the standard sold length of the damming member allowing the fast, versatile, and easy installation of the insulation damming device.

4,400,767

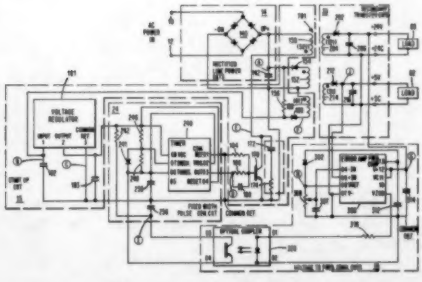
SELF START FLYBACK POWER SUPPLY

William S. Fenter, Marlboro, Mass., assignor to Honeywell Information Systems Inc., Waltham, Mass.

Filed Jun. 30, 1981, Ser. No. 279,108

Int. Cl.³ H02P *13/22*

U.S. Cl. 363—21 **38 Claims**



1. A switching regulator power supply connected to a DC source of rectified AC voltage and having a regulation cycle of operation consisting of an energy storage cycle and an energy transfer cycle, said supply comprising:

pulse generator circuit means having a supply voltage input terminal and an output terminal, said circuit means generating pulses having a predetermined fixed pulse width at a variable frequency rate;

start-up circuit means connected to said DC source and to said pulse generator circuit means, said start-up circuit means including:

power switching transistor circuit means connected to one end of said DC source and to said output terminal of said pulse generator circuit, said transistor circuit means providing current during said energy storage cycle in response to said pulses;

transformer means having a primary winding with one end connected to the other end of said DC source and the other end connected to said power transistor circuit means to permit current flow in a first direction during said energy storage cycle and in the other direction during said energy transfer cycle, and

a feedback primary winding having one end connected to said other end of said DC source and the other end, said feedback primary winding being AC coupled to said primary winding so as to provide a predetermined voltage during a first energy storage cycle; and,

RC controlled voltage regulator circuit means being connected to said one end of said DC source, to said other end of said second primary winding and to said input voltage terminal of said pulse generator circuit means, said RC controlled means, said RC controlled voltage regulator circuit means in response to said rectified AC voltage being operative to apply sufficient supply voltage to said input supply voltage terminal, for causing said generator circuit means to provide an output voltage, said power transistor circuit means in response to said output voltage producing said current flow in said first direction through said first primary winding and said feedback winding in response to said current flow applying said predetermined voltage to said RC controlled voltage regulator circuit means causing said regulator circuit means to increase said output voltage applied to said voltage supply input terminal to a normal operating value within a predetermined period of time, said pulse generator circuit means in response to said value being conditioned to generate pulses having said predetermined pulse width and at a maximum rate of frequency for maximizing the storage and transfer of energy during initial operation.

4,400,768

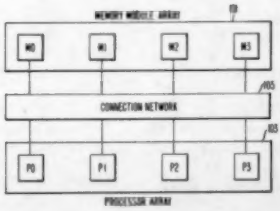
PARALLEL ACCESS COMPUTER MEMORY SYSTEM EMPLOYING A POWER-OF-TWO MEMORY MODULES

Christopher J. Tomlinson, Malvern, Pa., assignor to Burroughs Corporation, Detroit, Mich.

Filed Jun. 4, 1980, Ser. No. 156,357

Int. Cl.³ G06F *15/16*

U.S. Cl. 364—200 **4 Claims**



1. A parallel data processing system architecture capable of processing in parallel a plurality data elements from a stored

linear vector, said parallel data processing system architecture comprising:

a plurality of parallel processors, each processor therein for fetching and processing a particularly associated data element of said stored linear vector, said plurality of parallel processors being in number a power-of-two;

a plurality of parallel addressable memory modules storing said linear vector, said data element thereof particularly associated with each processor (P) stored at an address A(P), each memory module in said plurality thereof having a plurality of data element storage locations, each data element storage location therein for storing an individual data element of said linear vector, said plurality of parallel addressable memory modules being in number a power-of-two other than two;

connection network means interposing said plurality of parallel addressable memory modules and said plurality of parallel processors, said connection network means for providing a plurality of requested data communications paths between said plurality of parallel processors wherein each provided data communications path in said plurality thereof is provided as requested to an individual memory module in said plurality of parallel processors for the fetching of a data element of said stored linear vector from said individual memory module to said individual processor; and

means associated with each parallel processor in said plurality thereof for requesting a data communications path through said connection network means to a particular addressable memory module M(p) in said plurality thereof and for specifying a particular storage location L(P) in said plurality thereof in accord with the relationships:

$$M(P)=(A(P)+del\cdot L(P)+g\cdot(L(P)DIVM))\text{modulo } M,$$

and

$$L(P)=A(P)DIVM$$

wherein:

A(P)=the address storing said particularly associated data element associated with a particular processor (P) in said plurality thereof,

M(P)=the particular memory module in said plurality thereof storing said particularly associated data element,

L(P)=the particular storage location within M(P) storing said particularly associated data element,

DIV=integer division,

M=the number of memory modules in said plurality thereof,

del=a small odd integer chosen to assure that M-del is a prime number, and

g=the number positive unity.

4,400,769

VIRTUAL MACHINE SYSTEM

Saburo Kaneda, Yokohama; Naomi Matsumura, Tokyo; Fujio Ikegami, Yokohama; Kazuyuki Shimizu, Machida, and Yukichi Ikuta, Tama, all of Japan, assignors to Fujitsu Limited, Kawasaki, Japan

PCT No. PCT/JP80/00023, § 371 Date Oct. 21, 1980, § 102(e) Date Oct. 15, 1980, PCT Pub. No. WO80/01850, PCT Pub. Date Sep. 4, 1980

PCT Filed Feb. 20, 1980, Ser. No. 198,010

Claims priority, application Japan, Feb. 21, 1979, 54-19440

Int. Cl.³ G06F *9/00, 9/46*

U.S. Cl. 364—200 **14 Claims**

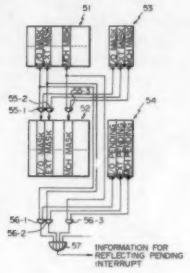
1. A virtual machine system for using a management program to run a plurality of operating systems parallelly, the virtual machine system having a CPU which comprises:

a virtual machine controlling PSW register which stores the PSW (program status word) information for controlling said operating systems;

a modification register which stores information for modifying said PSW information;

a pending register which stores information indicating a pending interrupt with respect to a corresponding operating system;

a first means responsive to the contents of said virtual machine controlling PSW register and said modification register for modifying current PSW information which is used for controlling the hardware of the virtual machine system, even though said virtual machine controlling PSW register indicates that a mask operation is to be conducted, in accordance with the information contained



in said modification register, so that said mask operation is cancelled; and

a second means responsive to the contents of said virtual machine controlling PSW register and said pending register for communicating the information about said pending interrupt contained in said pending register to the corresponding operating system when the PSW information is said virtual machine controlling PSW register is changed to information which indicates that the interrupt operation is to be conducted.

4,400,770

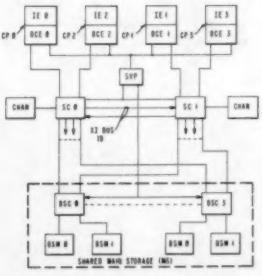
CACHE SYNONYM DETECTION AND HANDLING MEANS

Shiu K. Chan; John A. Gerardi, both of Poughkeepsie, and Bruce L. McGilvray, Pleasant Valley, all of N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Nov. 10, 1980, Ser. No. 205,486

Int. Cl.³ G06F *13/00*

U.S. Cl. 364—200 **15 Claims**



1. Cache synonym control means for a data processing system having a store-in-cache (SIC) and an instruction execution unit (IE), comprising:

set-associative cache directory means for receiving main storage logical address requests from the IE,

address translation means for translating the logical address of an IE request into a requested translated address in main storage,

class registering means for addressing classes in the set-associative directory means, the class registering means receiving a subset of bits in the requested logical address for providing a class address for selecting a class in the cache directory means, the subset of bits containing translatable bits and non-translatable bits and defining the address of a principle class,

search control means receiving the content of the class registering means and initially searching the cache directory means for the principle class in the class registering means, the search control means generating a miss signal if the translated address is not found in the principle class,

address altering means responding to the miss signal by permutating the translatable bits of the principle class to a permutated value, the address altering means providing the permutated value to overlay the translatable bits in the class registering means to generate a synonym class address,

additional search control means to control the search in the directory means of each synonym class address provided to the class registering means by the address altering means, means for actuating the address altering means to generate a next permutated value for the class registering means after each class search controlled by the additional search control means,

means for capturing any permutated address in the address altering means for which the additional search control means finds the translated address in the cache directory means or indicates the translated address is not found in any synonym class address, and

means for accessing the SIC for data located at the permutated address captured by the capturing means,

whereby the capturing means detects any synonym class existing in the cache or detects that no synonym class exists.

4,400,771

MULTI-PROCESSOR SYSTEM WITH PROGRAMMABLE MEMORY-ACCESS PRIORITY CONTROL

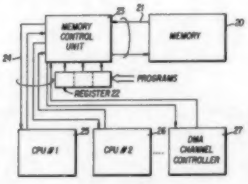
Seigo Suzuki, Yokohama, and Seiji Eguchi, Kawasaki, both of Japan, assignors to Tokyo Shibaura Electric Co., Ltd., Tokyo, Japan

Continuation-in-part of Ser. No. 45,656, Jun. 5, 1979, abandoned, which is a continuation of Ser. No. 747,974, Dec. 6, 1976, abandoned. This application Nov. 21, 1980, Ser. No. 209,216

Claims priority, application Japan, Dec. 4, 1975, 50-144631; Dec. 4, 1975, 50-144632

Int. Cl.³ G06F *15/16, 15/18*

U.S. Cl. 364—200 **9 Claims**



1. A multi-processor system comprising:

a plurality of processors;

a common shared memory for use by said processors, said processors each adapted to generate a respective memory request signal to request access to said common shared memory;

a bus connected to said processors and said memory for transferring data from said processors to said memory or from said memory to said processors;

register means for storing priority information designating a memory access grade priority for each of said processors, said priority information changeable in a predetermined manner and remaining fixed irrespective of access of said memory by any of said processors until being changed in said predetermined manner, said register means outputting priority information signals which indicate the memory access grade priority of each of said processors; and

priority control means for receiving said priority information signals from said register means, for receiving said memory request signals from said processors when said processors request access of said memory, and for outputting an acknowledge signal enabling memory access to that processor requesting use of the memory and having among the processors requesting memory access the highest memory access grade priority stored in said register means;

whereby the priority of memory access of said processors is changed by changing the contents of said register means.

4,400,772

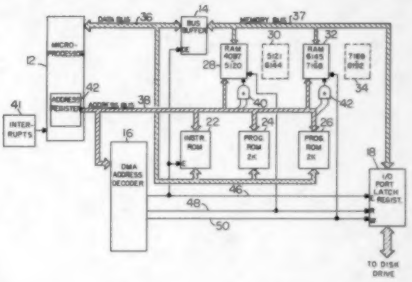
METHOD AND APPARATUS FOR DIRECT MEMORY ACCESS IN A DATA PROCESSING SYSTEM

Douglas W. Broyles, San Jose, and Ronald S. Palmer, Sunnyvale, both of Calif., assignors to International Memories, Inc., Cupertino, Calif.

Filed Dec. 30, 1980, Ser. No. 221,467

Int. Cl.³ G06F *13/00*

U.S. Cl. 364—200 **10 Claims**



1. In a data processing system comprising a data transfer means which is capable of direct memory access to data associated with a central processing unit, said data transfer means having data ports capable of data transfer, independent of said cantral processing unit, a central processing unit with a data port, an address port and an interrupt port, said central processing unit being responsive to specific external digital signals, such as interrupt signals and instruction signals, for issuing digital address signals to an addressable memory space, memory means for storing data associated with said central processing unit and arranged in memory units, each said memory unit having memory locations with addresses within said memory space, an address port and a data input/output port, the improvement comprising:

an address decoder having an address input port and a control output port, said decoder being coupled to a third bus means and operative to generate specific digital control signals in response to address information directed by said central processing unit to addresses, designated herein vacant addresses, in said memory space which are addresses other than of said memory locations of said memory means, said address information being operative to permit transfer of instruction control from said central processing unit;

means having an address input port and a data output port for generating digital data representative of instructions for said central processing unit;

first bus means coupling together said data port of said instructions generating means and said data port of said central processing unit;

second bus means coupling together each said data port of said

memory means and said data port of said data transfer means;

third bus means coupling together said address port of said instructions generating means, with each said address port of said memory means and said central processing unit; and

gate means coupled to said third bus means and to specific portions of said memory means for allocating address information directed at selected portions of said memory space to other portions of said memory space within said memory means, said address decoder further being coupled through control output ports to said data transfer means and operative through said control output ports to enable data transfer between said memory means via said second bus means through said data port of said data transfer means in response to receipt of special addresses from said central processing unit designated for use with instructions external of said central processing unit.

4,400,773

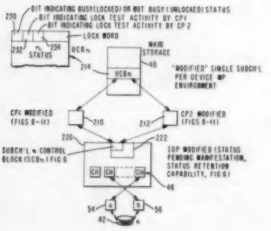
INDEPENDENT HANDLING OF I/O INTERRUPT REQUESTS AND ASSOCIATED STATUS INFORMATION TRANSFERS

Paul J. Brown, Poughkeepsie; Robert J. Dugan, Hyde Park, and Richard R. Guyette, Hopewell Junction, all of N.Y., assignors to International Business Machines Corp., Armonk, N.Y.

Filed Dec. 31, 1980, Ser. No. 221,604

Int. Cl.³ G06F *3/04*

U.S. Cl. 364—200 **8 Claims**



1. In a data processing system having a channel subsystem and having a central complex arranged to operate with said channel subsystem, said central complex including multiple central processing units and including means for storing the status of a device that is part of the channel subsystem in which a first central processing unit may be locking and accessing said status storing means to start an operation at a device at the same time that a second central processing unit is operating to process information stored in said channel subsystem pertaining to the status of said device, and to update device status in said status storing means while said status storing means is locked by said first central processing unit means for preventing said first unit from starting said operation with reference to outdated status information comprising:

first condition manifesting means in said channel subsystem for manifesting a status pending condition for said device and means in said channel subsystem for actuating said first condition manifesting means to manifest said status pending condition when said channel subsystem receives and stores status change information pertaining to said device;

means in said central complex for testing said manifesting means and means for preventing said first unit from directing a starting stimulus to said device while said status pending condition is being manifested by said first condition manifesting means;

and means in said central complex supervised in common with said first and second central processing units for clearing said status pending condition only when said central complex is capable of supervising the processing of said status information in common with any starting operations directed to said device.

4,400,774

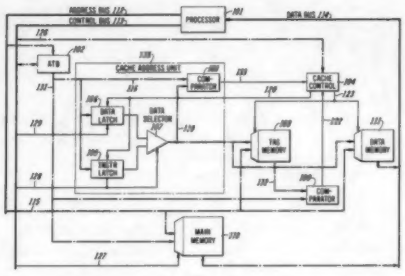
CACHE ADDRESSING ARRANGEMENT IN A COMPUTER SYSTEM

Wing N. Toy, Glen Ellyn, Ill., assignor to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed Feb. 2, 1981, Ser. No. 230,893

Int. Cl.³ G06F *9/06*

U.S. Cl. 364—200 **7 Claims**



1. A computer system comprising:

a processor for generating and transmitting read control signals and virtual address signals including word address signals;

cache memory means having a plurality of word locations;

address translation means responsive to certain of said virtual address signals for generating present cache address signals and other address signals;

memory access control means comprising address storage means for storing previous cache address signals and cache control means responsive to said read control signals to transmit a first cache control signal and the stored previous cache address signals to said cache memory;

said cache memory means being responsive to said first cache control signal, said stored address signals, and said word address signals to read a first one of said plurality of word locations for transmitting the contents of said first one of said plurality of word locations to said processor;

said memory access control means further comprising comparator means for comparing said stored address signals and said present cache address signals to generate a first compare signal if said stored address signals equal said present cache address signals and to generate a second compare signal if said stored address signals are not equal to said present cache address signals;

said cache control means being responsive to said first compare signal to generate and to transmit a completion signal to said processor and responsive to said second compare signal to generate a second cache control signal.

4,400,775

SHARED SYSTEM FOR SHARED INFORMATION AT MAIN MEMORY LEVEL IN COMPUTER COMPLEX

Masaharu Nozaki, Fuchu; Hiroshi Nakamura, Kunitachi, and Yusaku Miki, Fuchu, all of Japan, assignors to Tokyo Shibaura Denki Kabushiki Kaisha, Kawasaki, Japan

Filed Feb. 26, 1981, Ser. No. 238,657

Claims priority, application Japan, Feb. 28, 1980, 55-24413; Feb. 28, 1980, 55-24414; Feb. 28, 1980, 55-24415

Int. Cl.³ G06F *15/16*

U.S. Cl. 364—200 **4 Claims**

1. A system for accessing shared information at a main memory level in a computer complex comprising a plurality of computers operatively coupled to one another for data pro-

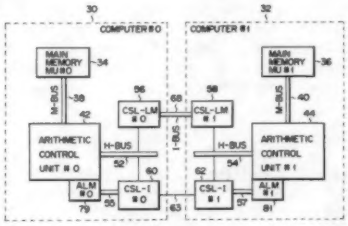
cessing, each computer having the capability of being either a host computer or a slave computer, at least one of the computers having a shared information storage region in its main memory means, each said computer comprising:

(a) main memory means for storing at least local data to be processed within said computer;

(b) means, coupled to said main memory means, for controlling the reading of data therefrom and the writing of data therein;

(c) arithmetic control means, coupled to said main memory control means, for controlling data processing operations involving said local data;

(d) computer system linkage memory means, coupled to said main memory controlling means, for enabling access to said main memory means of all other computers through their corresponding computer system linkage interrupt means at a machine word level, thereby permitting the writing of shared information stored in the main memory means of the one of said computers into said main memory means of all other computers;



(e) alarm means, coupled to said arithmetic control means, for detecting a problem in said arithmetic control means;

(f) computer system linkage interrupt means, coupled to said arithmetic control means and alarm means, for transmitting an interrupt instruction to said arithmetic control means of all the other computers through their corresponding computer system linkage interrupt means in accordance with a command from said computer system linkage memory means or said alarm means;

(g) high speed input/output bus means for connecting said computer system linkage memory and said computer system linkage interrupt means; and

(h) means operatively connected to said arithmetic control means for altering one section of a logic address space viewed from each said computer to any one of a plurality of sections of a physical address space so that the logic addresses of the shared information storage region which are respectively viewed from the programs of said computers are identical.

4,400,776

DATA PROCESSOR CONTROL SUBSYSTEM

Dieter Bazlen, Stuttgart; Dietrich W. Bock, Schoenaich; Klaus J. Getzlaff, Boeblingen; Johann Hajdu, Boeblingen, and Helmut Painke, Boeblingen, all of Fed. Rep. of Germany, assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Sep. 12, 1980, Ser. No. 186,883

Claims priority, application Fed. Rep. of Germany, Sep. 12, 1979, 2936801

Int. Cl.³ G06F *9/00*

U.S. Cl. 364—200 **5 Claims**

1. A data control subsystem for executing instructions comprising:

a main memory;

a local store coupled to said main memory by way of a long path and a short path;

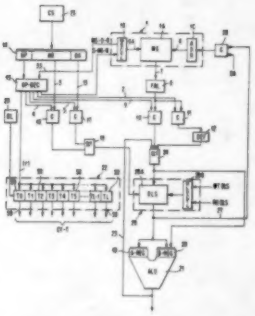
an instruction decoder for generating control signals from an instructions;

an instruction cycle counter means coupled to said instruction decoder, said instruction cycle counter means further comprising:

a counter for generating a chain of time control signals that correspond to an instruction to be executed;

an insertion means coupled to said counter and actuated by at least one of said control signals for inserting at least one additional time control signal for an instruction routing data from said main memory to said local store by way of said long path; said at least one additional time control signal being inserted in said chain of time control signals to accommodate the longer propagation time associated with said long path; and

a bypass means coupled to said counter and said insertion means for bypassing said insertion means when an instruction to be executed is routing data from said main



memory to said local store by way of said short path, said bypass means being actuated by at least one of said control signals;

a clock generator coupled to said instruction cycle counter means for generating clock signals which activate and deactivate said instruction cycle counter means; and

data flow control gates coupled to said main memory, said local store, and said instruction decoder for receiving at least one of said control signals and accordingly routing data between said main memory and said local store;

whereby the complexity of said instruction decoder is decreased since said instruction decoder generates the same control signals for equal instructions routing data from said main memory to said local store by way of said long path as those instructions routing data from said main memory to said local store by way of said short path due to said insertion means and said bypass means.

4,400,777

INFORMATION PROCESSING SYSTEM FOR A COMPUTER OUTPUT MICROFILMER

Sumio Mori, Asaka, Japan, assignor to Fuji Photo Film Co., Ltd., Kanagawa, Japan

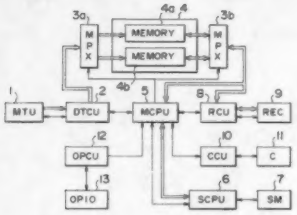
Continuation of Ser. No. 940,307, Sep. 6, 1978, abandoned. This application Jun. 3, 1981, Ser. No. 269,960

Int. Cl.³ G06F *15/16, 15/20, 3/153, 3/08*

U.S. Cl. 364—200 **4 Claims**

1. An information processing system for a computer output microfilmer in which sub-information such as titles and indices is recorded on a recording medium such as a microfilm together with processed main information comprising an input means responsive to a computer which pre-processed said main information, a main information processing means for processing the pre-processed main information to provide said processed main information, a sub-information processing

means, and an output means responsive to the main information processing means for recording on said recording medium, said main information processing means including (a) means for processing the pre-processed main information read out from said input means, (b) means for transferring the processed main information to said output means, (c) means for controlling the recording of the processed main information transferred to said output means onto said recording medium, (d) means for detecting key words that are part of said titles or indices and predetermined commands from said pre-processed main information read out from said input means, and (e) means for transferring the detected key words and predetermined commands to said sub-information processing means as



input information thereto, said sub-information processing means including (a) means for preparing said sub-information including said titles or indices based on the key words thereof when the same has received said key words from said main information processing means, (b) means for transferring said prepared sub-information to said output means when the sub-information processing means has received said predetermined commands and (c) means for processing the sub-information at the same time said main information processing means is processing the pre-processed main information and controlling the recording of the processed main information and said main information processing means further including means for controlling the recording of the sub-information after the pre-processed main information has been processed.

4,400,778

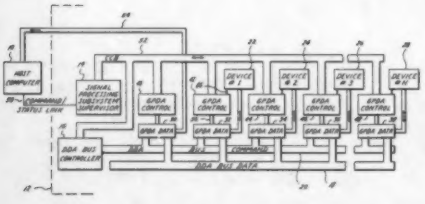
LARGE-VOLUME, HIGH-SPEED DATA PROCESSOR

John Vivian; Patrick R. Cooper; Ronald B. Higgins; John A. Harlan; Paul M. Perry; Juan B. Vallhonrat, and Donald P. Golden, Jr., all of Houston, Tex., assignors to Litton Resources Systems, Inc., Houston, Tex.

Continuation of Ser. No. 91,668, Nov. 5, 1979, abandoned. This application Dec. 7, 1981, Ser. No. 328,038

Int. Cl.³ G06F *13/00*

U.S. Cl. 364—200 **14 Claims**



1. A data processing subsystem (12) associated with a host computer (10) said host computer including means for generating a queue of transaction command packets, comprising:

a supervisor (14) for receiving from said host computer at least one transaction command packet, said transaction command packet consisting of a plurality of supervisor command packets, said supervisor further including means for transforming selected supervisor command packets into device command packets;

a direct device access bus (18, 20);

a command control bus (52)

a plurality of peripheral devices (22, 24, 26, 28) having equal priority, each being interfaced to said direct device access bus and to said command control bus by its own dedicated programmable general purpose device adapter (32/42, 34/44, 36/46, 38/48);

register means (95) in each said programmable general purpose device adapter for receiving from said supervisor over said command control bus, a selected device command packet including a unique transaction code for identifying certain ones of said plurality of peripheral devices as being members of one of several different sets of devices, a separate transaction code being assigned to each specific set and to all of the members thereof;

a bus controller (16) interconnected between said supervisor and said direct device access bus;

means in said bus controller, for establishing a plurality of time slots and a register means (41) for associating, in cooperation with said supervisor, selected time slots with selected transaction codes; and

means (39) for enabling substantially concurrent direct data transfers between members of the respective device sets over the direct device access bus during specified time slots, a different time slot being assigned to each different set.

4,400,779

METHOD AND APPARATUS FOR INDICATING MILEAGE CORRESPONDING TO REMAINING FUEL FOR VEHICLES

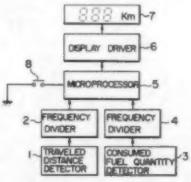
Shuichi Kosuge, Nagoya; Hiroshi Ogura, Kariya; Hiroshi Arai, and Hisatoshi Ohta, both of Toyota, all of Japan, assignors to Toyota Jidosha Kogyo Kabushiki Kaisha, Toyota and Nippondenso Co., Ltd., Kariya, both of, Japan

Filed Apr. 1, 1981, Ser. No. 249,877

Claims priority, application Japan, Apr. 3, 1980, 55-44459

Int. Cl.³ G01M *13/26*

U.S. Cl. 364—442 **6 Claims**



1. In a method of indicating a mileage corresponding to remaining fuel for a vehicle including the steps of detecting a distance traveled by a vehicle, detecting a quantity of fuel consumed by said vehicle, computing a fuel consumption in accordance with said detected traveled distance and consumed fuel quantity, computing a mileage of said vehicle in accordance with said computed fuel consumption and a quantity of fuel remaining in said vehicle and indicating said computed mileage, the improvement comprising the steps of:

determining whether said remaining fuel quantity is smaller than a predetermined value;

computing said mileage in accordance with a prior average fuel consumption when the result of said determination is negative;

successively updating said average fuel consumption by modifying the same with momentary fuel consumption data obtained at predetermined intervals when the result of said determining step is affirmative, and

computing said mileage in accordance with said updated fuel

consumption when the result of said determination is affirmative.

4,400,780

MOVING BODY TRACK INDICATOR SYSTEM

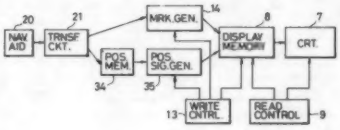
Syuji Nagao, Takarazuka; Ryoichi Nakai, Kobe, and Kazuo Yamauchi, Takarazuka, all of Japan, assignors to Furuno Electric Co., Ltd., Nagasaki, Japan

Filed Apr. 22, 1980, Ser. No. 142,793

Claims priority, application Japan, Apr. 27, 1979, 54-52716; Jun. 21, 1979, 54-78973

Int. Cl.³ G01S *7/04*

U.S. Cl. 364—449 **16 Claims**



12. A moving body track indicating system which indicates the track of a moving body on the indicating surface of an indicator in response to information supplied from means for measuring the position of the moving body comprising:

(i) transforming means for producing first and second signals respectively indicating the longitude and the latitude of the position of the moving body in response to the information supplied from said means for measuring the position of the moving body;

(ii) line markers signals generating means for producing signals corresponding to longitude and latitude line markers in response to the first and second signals from said transforming means;

(iii) cursor line markers signal generating means for producing signals corresponding to cursor line markers parallel to the latitude and the longitude line markers;

(iv) first storing means for storing signals corresponding to each of the track of the moving body, the longitude line and the latitude line markers, and the cursor line markers;

(v) writing means for writing signals produced in response to signals from said body position signal generating means, said line markers signal generating means, and said cursor line markers signal generating means into said first storing means;

(vi) second storing means for storing the first and second signals from said transforming means;

(vii) body position signal generating means for producing signals corresponding to the position marks of the moving body constituting the track thereof in response to the first and second signals from said second storing means;

(viii) indicating means for displaying on said indicating surface the track of the moving body, the longitude and the latitude line markers, and the cursor line markers, and;

(ix) controlling means for reading signals from said first storing means and supplying them to said indicating means.

4,400,781

NUMERICAL CONTROLLER FOR CAM GRINDING MACHINE

Shigeo Hotta, Nagoya, and Katsumi Yamamoto, Takahama, both of Japan, assignors to Toyoda Koki Kabushiki Kaisha, Kariya, Japan

Filed Jan. 27, 1981, Ser. No. 228,884

Claims priority, application Japan, Feb. 12, 1980, 55-16460

Int. Cl.³ B24B *51/00*

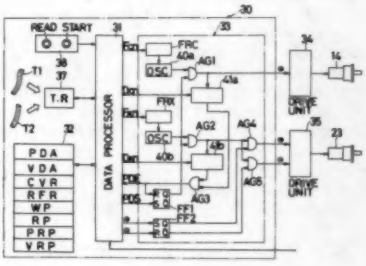
U.S. Cl. 364—474 **6 Claims**

3. A numerical controller for controlling pulse distribution to a cam drive unit for rotating a cam to be ground and to a grinding wheel drive unit for moving a grinding wheel to thereby grind said cam to a desired cam profile, comprising:

first memory means for storing a plurality of profile data respectively corresponding to a plurality of angular ranges through which said cam is rotated, each of said profile data representing the number of pulses which are to be distributed to said grinding wheel drive unit when said cam is rotated through one of said angular ranges corresponding to said each of said profile data;

first feed rate calculation means for calculating, respectively based upon said plurality of said profile data stored in said first memory means, a plurality of first distribution speeds which respectively correspond to said plurality of said angular ranges and at each of which pulses are to be distributed to one of said cam unit and said grinding wheel drive unit when said cam is rotated through a corresponding one of said angular ranges, each of said first distribution speeds being inversely proportional to the number of pulses which is represented by a corresponding one of said profile data;

second memory means for storing a plurality of data respectively indicative of said plurality of said first distribution speeds calculated by said first feed rate calculation means;



data output means operable each time said cam is rotated through one of said angular ranges for outputting one of said profile data and one of said first distribution speed data corresponding to a successive one of said angular ranges respectively from said first and second memory means and for further outputting numerical data indicative of the number of pulses which are to be distributed to said cam drive unit when said cam is rotated through said successive one of said angular ranges;

second feed rate calculation means for calculating, based upon said one of said profile data, said one of said first distribution speed data and said numerical data output by said data output means, a second distribution speed at which pulses are to be distributed to the other of said cam drive unit and said grinding wheel drive unit when said cam is rotated through said successive one of said angular ranges; and

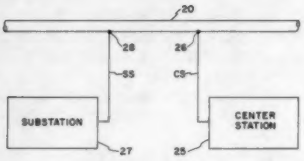
pulse distribution means responsive to said one of said first distribution speed data output from said second calculation means for distributing pulses to said one of said cam drive unit and said grinding wheel drive unit at said second distribution speed.

4,400,782

CORROSION MONITORING SYSTEM USING A METAL PIPE FOR TRANSMISSION OF MONITORING SIGNALS

Masashi Ishikawa; Masatoshi Shimada; Katsutomo Okamoto, all of Tokyo; Shigeyoshi Sugita, Shiroimachi; Masayuki Goto; Yukuo Koizumi, both of Yokohama, and Osamu Kaneda, Yono, all of Japan, assignors to Nippon Electric Co., Ltd., Tokyo, Japan

Filed Feb. 25, 1981, Ser. No. 238,107
Claims priority, application Japan, Feb. 29, 1980, 55-25451
Int. Cl.³ G01V *3/00*; G01R *31/02*
U.S. Cl. 364—481 **8 Claims**



1. A monitoring system for monitoring a degree of corrosion of a metal pipe surrounded by a mass, said degree increasing with time and varying from location to location along the length of said pipe, said pipe having a distribution of electrical potential along its length, the voltage levels of said potential distribution depending at least in part on said degree of corrosion, said system comprising:

a center station coupled to said pipe at a predetermined location; and

a substation coupled to said pipe at a preselected location and including means for detecting the degree of corrosion at said preselected location, means for supplying data signals to said pipe including a substation signal which is representative of the degree of corrosion detected at said substation; and

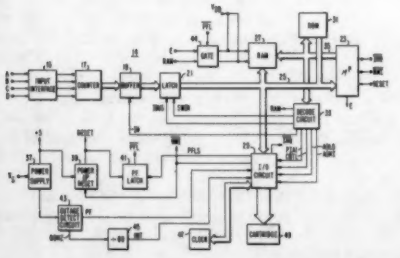
means at said center station responsive to the substation supplied data signals transmitted through said pipe to monitor the degree of corrosion detected at said substation.

4,400,783

EVENT-LOGGING SYSTEM

Philip F. Locke, Jr., Trafford, Pa., and Albert H. Maxwell, Jr., Raleigh, N.C., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Sep. 5, 1980, Ser. No. 184,458
Int. Cl.³ G11C *11/00*; G06F *15/20*
U.S. Cl. 364—483 **52 Claims**



1. An event-logging system for recording digital data from a plurality of electrical energy metering devices, comprising:

input counters for continuously counting the pulses of the digital data, said counters producing a plurality of running counts each representative of said data produced by one of the metering devices;

control means for producing a plurality of control signals;

means for sampling said running counts, said means producing sample values of each of said running counts in response to said control signals, each of said sample values being input to said control means wherein said sample value has the previous sample value subtracted therefrom, the difference from said subtraction added to an interval sum stored in said control means;

means for producing an interrupt signal composed of pulses responsive to the frequency of a line voltage, said interrupt signal input to said control means, said control means producing a clock interrogation signal responsive to said interrupt signal, said control means producing a synchronization count in response to said pulses of said interrupt signal;

clock means producing real time information, said real time information input to said control means in response to said clock interrogation signal, said synchronization count compared by said control means to a predetermined value at preselected times, said clock means being reset by said control signals in response to said comparison such that said clock means is kept in synchronization with said line voltage;

a cartridge comprising removable solid state memory means; and

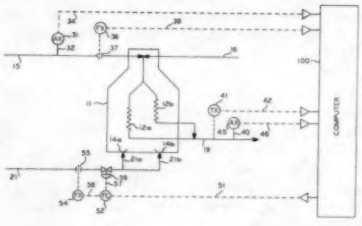
output interface means, said means inputting said real time information and said interval sums to said removable memory means according to a predetermined format in response to said control signals, said control means resetting said interval sums to zero upon the recording in said removable memory means of said interval sums.

4,400,784

CONTROL OF A CRACKING FURNACE

Gary L. Funk, Bartlesville, Okla.; Warren H. Huang, Taipei, Taiwan, and William S. Stewart, Bartlesville, Okla., assignors to Phillips Petroleum Company, Bartlesville, Okla.

Filed Feb. 25, 1981, Ser. No. 238,392
Int. Cl.³ G06F *15/46*
U.S. Cl. 364—500 **8 Claims**



1. Apparatus comprising:

a cracking furnace means;

means for supplying a feed stream to said cracking furnace means;

means for supplying a diluent fluid to said cracking furnace means, said diluent fluid being combined with said feed stream;

means for supplying a fuel to said cracking furnace means, the combustion of said fuel supplying heat to said cracking furnace means;

means for removing a gaseous mixture, containing the cracked components of said feed stream and containing said diluent fluid, from said cracking furnace means;

means for establishing a first signal representative of a calculated actual maximum tube skin temperature based on the measurements of process variables associated with said cracking furnace means;

means for establishing a second signal representative of a desired maximum tube skin temperature for said cracking furnace means;

means for comparing said first signal and said second signal and for establishing a third signal responsive to the difference between said first signal and said second signal; and

means for manipulating the heat supplied to said cracking furnace means in response to said third signal to thereby maintain the calculated actual maximum tube skin temperature substantially equal to the desired maximum tube skin temperature.

4,400,785

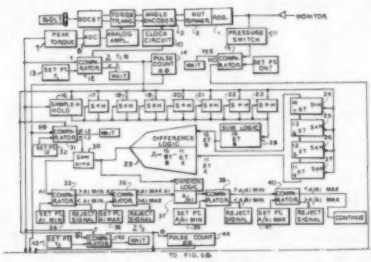
MICROPROCESSOR MONITORING SYSTEM FOR FASTENER TIGHTENING

William K. Wallace, Barneveld; David A. Giardino, Deerfield, and Joseph R. Groshans, Clinton, all of N.Y., assignors to Chicago Pneumatic Tool Company, New York, N.Y.

Continuation-in-part of Ser. No. 183,424, Sep. 2, 1980. This application Dec. 12, 1980, Ser. No. 215,571

Int. Cl.[3] **G06F** *15/20;* **B23P** *19/06*

U.S. Cl. 364—508 **5 Claims**



1. A method for monitoring a fastener assembly operation to determine if the operation meets predetermined standards, comprising the steps of applying torque to a fastener to rotate it a predetermined amount, calculating a base area under the resulting torque-angle curve thus generated, continuing application of torque to the fastener until another identical rotation amount is achieved, calculating the area under the subsequent torque-angle curve, establishing a quotient by dividing the value of the subsequent torque-angle curve area by the value of the torque-angle curve base area, comparing the quotient with a pre-established quotient range, and signalling if the quotient is not within the pre-established quotient range.

4,400,786

ELEVATOR SYSTEM WITH SPEECH SYNTHESIZER FOR AUDIBLE INFORMATION

Alan F. Mandel, Scott Township, Allegheny County; Kenneth M. Eichler, North Versailles, and Douglas A. Bauman, Franklin Township, Westmoreland County, all of Pa., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Dec. 12, 1980, Ser. No. 215,693

Int. Cl.[3] **B66B** *3/00;* **G10L** *1/08*

U.S. Cl. 364—513 **10 Claims**

1. An elevator system, comprising:

a building having a plurality of floors,

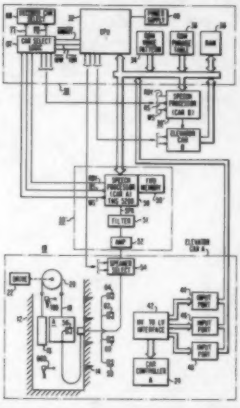
at least two elevator cars mounted for movement in said building to serve floors therein,

control means for each of said elevator cars for providing status signals indicative of the operation of its associated elevator car,

and communication means for providing audible, informative messages in each of said elevator cars in response to at least certain of their status signals,

said communication means including a first unit common to all of the elevator cars, with said first unit including a central processor unit, memory means having a first location for storing a predetermined vocabulary common to all messages, and a second location for storing a series of instructions for each message, said communication means further including a plurality of similar second units, one for each elevator car, with each second unit including sound reproduction means, and a speech synthesizer, with each speech synthesizer having memory means for storing information received from the memory means of the first unit,

said central processor unit being responsive to the control means of each of said elevator cars and operating in response to the status signals provided thereby to address



the instructions in the second location of said memory means, as required by a specific status signal, and using these instructions to extract vocabulary information from the first location of said memory means and store it in the memory means of the speech synthesizer associated with the elevator car to receive the audible message,

said central processor unit providing and maintaining sufficient vocabulary information in the memory means of each speech synthesizer such that audible messages may be simultaneously produced by the sound reproduction means of all of said elevator cars, when required, without interruption due to lack of vocabulary information.

4,400,787

ELEVATOR SYSTEM WITH SPEECH SYNTHESIZER FOR REPETITION OF MESSAGES

Alan F. Mandel, Scott Township, Allegheny County, and Kenneth M. Eichler, North Versailles, both of Pa., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Dec. 12, 1980, Ser. No. 215,894

Int. Cl.[3] **B66B** *3/00;* **G10L** *1/08*

U.S. Cl. 364—513 **10 Claims**

1. In an elevator system including

an elevator car,

control means for providing status signals indicative of the operation of the elevator car,

and communication means for providing audible, informative messages in the elevator car in response to at least certain of its status signals, with the communication means including a central processor unit, memory means having a first location for storing a predetermined vocabulary common to all messages, and a second location for storing a series of instructions for each message, said communication means further including sound reproduction means and speech synthesizer means, with said speech synthesizer means having memory means for storing information from said first memory means,

said central processor unit being responsive to the status

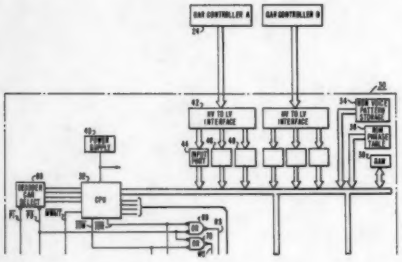
signals from said elevator car and operating in response thereto to address the instructions in said second memory means, as required by a specific status signal, and using these instructions to extract vocabulary information from said first memory means and store it in the memory means of said speech synthesizer means, the improvement comprising:

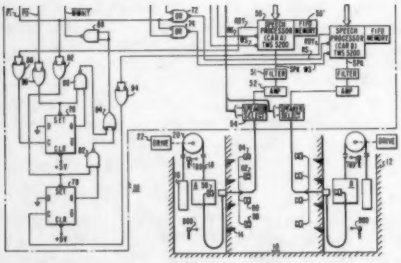
said communication means including means for varying a predetermined parameter of at least one of the messages before the repetition thereof, with the variation being apparent when the same information is repeated following such variation, to prevent a monotonous repetition of exactly the same message information audibly delivered in exactly the same manner when a predetermined status signal results in the repetition of the same information, and/or to change the emphasis or urgency of the message.

10. In an elevator system including

and elevator car,

control means for providing status signals indicative of the operation of the elevator car,





and communication means for providing audible, informative messages in the elevator car in response to at least certain of its status signals, with the communication means including a central processor unit, memory means having a first location for storing a predetermined vocabulary common to all messages, and second location for storing a series of instructions for each message, said communication means further including sound reproduction means and speech synthesizer means, with said speech synthesizer means having memory means for storing information from said first memory means,

said central processor unit being responsive to the status signals from said elevator car and operating in response thereto address the instructions in said second memory means, as required by a specific status signal, and using these instructions to extract vocabulary information from said first memory means and store it in the memory means of said speech synthesizer means, the improvement comprising:

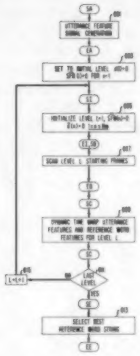
said communication means including a microphone providing a signal responsive to background noise, and means responsive thereto for directly varying the volume of the message in response to the level of background noise.

4,400,788

CONTINUOUS SPEECH PATTERN RECOGNIZER

Cory S. Myers, Brookline, Mass.; Frank C. Pirz, Madison, and Lawrence R. Rabiner, Berkeley Heights, both of N.J., assignors to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed Mar. 27, 1981, Ser. No. 248,570
Int. Cl.³ G10L *1/00*
U.S. Cl. 364—513 **50 Claims**



11. A method for recognizing a speech pattern as a string of predetermined reference words comprising the steps of: storing a set of signals representative of the time frame sequence of acoustic features of each reference word, said sequence having a beginning frame and an ending frame; producing a set of signals representative of the time frame sequence of acoustic features of the speech pattern; generating at least one reference word string responsive to the speech pattern acoustic feature signals and the reference word acoustic feature signals; and identifying the speech pattern as one of the generated reference word strings characterized in that said reference word string generation comprises: producing a set of signals identifying successive reference word levels; assigning a segment of the speech pattern to each successive level; for each level, time registering the level speech pattern segment feature signals with the feature signals of the reference words to produce level time registration speech pattern segment endframe signals and time registration correspondence signals for said reference words, and selecting reference word strings responsive to the time registration speech pattern endframe and time registration correspondence signals of the levels.

4,400,789

MAGNETIC HEADING SIMULATOR

Dennis O. Carpenter, Bothell, and Robert E. Ceola, Auburn, both of Wash., assignors to The Boeing Company, Seattle, Wash.

Filed Sep. 30, 1980, Ser. No. 192,250
Int. Cl.³ G06F *15/20*; G06J *1/00*
U.S. Cl. 364—578 **10 Claims**

5. A magnetic heading simulator system for producing a signal representative of a value of magnetic heading and simulative of a signal produced by a conventional flux valve, said magnetic heading simulator system comprising:

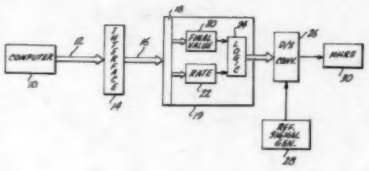
first means for producing a first word of digital data, at least a first portion of which is representative of a desired value of magnetic heading;

first register means coupled to said first means for receiving

and holding said first portion of said first word of digital data;

counter means containing a count representative of a present value of magnetic heading;

logic means coupled to said first register means and said counter means and operable to update said count in said counter means such that said count is equal to said first portion of said first word of digital data;



digital-to-analog converter means coupled to said counter means for receiving said count and converting said count to an analog signal representative of said desired value of magnetic heading, said digital-to-analog converter means including a digital-to-synchro converter for producing an analog signal simulative of a three-wire synchro, and reference signal generation means coupled to said digital-to-synchro converter to provide a reference signal to said digital-to-synchro converter to enable said digital-to-synchro converter output to be simulative of a flux valve.

4,400,790

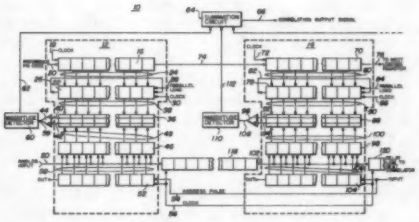
TRANSVERSAL CORRELATOR

Ramon P. Chambers, Clearwater, and William H. Mosley, Jr., St. Petersburg, both of Fla., assignors to E-Systems, Inc., Dallas, Tex.

Filed Jan. 6, 1981, Ser. No. 222,992

Int. Cl.³ G06J 1/00; G06G 7/19

U.S. Cl. 364—604 **22 Claims**



1. Apparatus for correlating an input signal with a preselected bit sequence, comprising:

a plurality of correlation subsections each comprising:

means for sampling said input signal to produce a series of analog samples;

means for storing a preset number of said analog samples, each new sample replacing the oldest stored sample;

buffer register means for storing a section of said preselected bit sequence;

circulating register means parallel connected to said buffer register means for receiving said section of said bit sequence stored therein in response to a parallel load signal and sequentially circulating said bit sequence through the cells thereof;

means for correlating said bit sequence in said circulating register with said analog samples to produce a correlation signal when said bit sequence in said circulating register is aligned with a corresponding sequence of said analog samples in said means for storing;

delay means for serially transferring said input signal analog samples between each of said correlation subsections; and

means for summing the correlation signals produced by each of said correlation subsections to generate a correlation output signal.

4,400,791

DOT MATRIX PRINTER WITH COMPRESSED CHARACTER DATA STORAGE

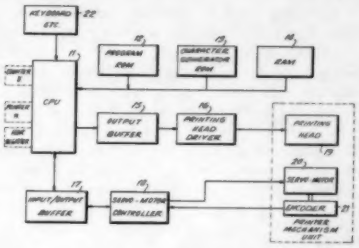
Haruo Kitado, Shiojiri, Japan, assignor to Epson Corporation, Nagano, Japan

Filed Oct. 8, 1980, Ser. No. 195,229

Claims priority, application Japan, Oct. 9, 1979, 54/130463

Int. Cl.³ G06F 3/12

U.S. Cl. 364—900 **24 Claims**



1. A printer for printing characters in a matrix pattern of m×n dots, comprising:

character data arranged in m rows×n columns;

first memory means for storing said character data, said first memory means having at least the same number of addresses as the number n of said columns, each said address including bits corresponding in number to said rows;

u half-shift instructions for shifting selected dots in printed characters, said half-shift instructions being included in designated columns between the columns comprising said character data, said half-shift instructions respectively being stored in a different address immediately preceding the address of columns in said first memory means including data of dots to be shifted, said half-shift instructions including as many bits as said bits in each said data storage address;

means for distinguishing between the state of a first key bit of each address in said first memory means, said first key bit indicating when the data stored in the associated address is said character data or one said half-shift instruction;

reading means for reading out said character data and said half-shift instructions in a first sequence from said addresses of said first memory means, and

printing means for printing said characters in response to data from said means for reading out.

4,400,792

DUAL-CHANNEL DATA PROCESSING SYSTEM FOR RAILROAD SAFETY PURPOSES

Horst Strelow, Cremlingen, Fed. Rep. of Germany, assignor to Siemens Aktiengesellschaft, Berlin & Munich, Fed. Rep. of Germany

Filed Jan. 16, 1981, Ser. No. 225,798

Claims priority, application Fed. Rep. of Germany, Jan. 30, 1980, 3003291

Int. Cl.³ G06F 15/16, 11/00

U.S. Cl. 364—900 **3 Claims**

1. A dual-channel data processing system, for operating a safety device, comprising:

a data input for receiving data to be processed and a data output for connection to the safety device;

first and second microcomputers, each of said microcomput-

ers including a plurality of input lines connected to said data input and a plurality of output lines and each of said microcomputers operable to process data received on its input lines and produce processed data on its output lines;

first and second comparators each including an output, first inputs connected to the output lines of said first microcomputer and corresponding second inputs connected to said output lines of said second microcomputer, and each of said comparators operable to provide a first signal at its output in response to receiving equal data from said microcomputers and a second signal at its output in response to receiving unequal data from said microcomputers;

first and second AND gates each including an output, a clock input for receiving clock pulses, and a signal input connected to said output of a respective comparator, said AND gates operable in response to clock pulses and said first signals to produce rectangular pulses at their respective output;

first and second rectifiers, and first, second and third transformers each including a primary and a secondary; and

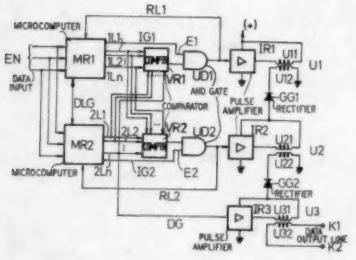
first, second and third pulse amplifiers each including a voltage supply input, a pulse input and an output,

said voltage supply input of said first pulse amplifier connected to a voltage supply, said output of said first pulse amplifier connected to said primary of said first transformer and said pulse input connected to said output of said first AND gate, said first pulse amplifier operable in response to the rectangular pulses to cause said first transformer to couple pulses to said secondary of said first transformer,

said voltage supply input of said second pulse amplifier connected via said first rectifier to said secondary of said first transformer, said output of said second pulse amplifier connected to said primary of said second transformer and said pulse input of said second pulse amplifier connected to said output of said second AND gate, said second gate amplifier operable in response to the rectangular pulses and the operation of said first pulse amplifier to cause said second transformer to couple pulses to said secondary of said second transformer,

said secondary of said third transformer connected to said data output, and

said voltage supply input of said third pulse amplifier connected via said second rectifier to said secondary of said second transformer, said output of said third pulse amplifier connected to said primary of said third transformer, and said pulse input connected to one of said microcomputer output lines, said third pulse amplifier operable to control the safety device via said third transformer in response to the operation of said second pulse amplifier and data on said one microcomputer output line.



4,400,793

METHOD AND ARRANGEMENT FOR FAST ACCESS TO CCD-STORES

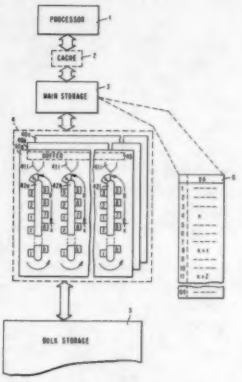
Claus Schuenemann, Schoenaich, Fed. Rep. of Germany, assignor to International Business Machines Corp., Armonk, N.Y.

Continuation of Ser. No. 86,215, Oct. 18, 1979, abandoned. This application Feb. 19, 1982, Ser. No. 350,456

Claims priority, application Fed. Rep. of Germany, Dec. 12, 1978, 2853501

Int. Cl.³ G06F *13/06*

U.S. Cl. 364—900 **3 Claims**



1. The method of transfer of units of data between a random access storage and a slower cyclic storage which operates at a fast cyclic speed when it is accessed for transfer of data and a slow cyclic speed when it is not so accessed and which stores each of a plurality of units of data in a separate one of a plurality of storage locations that move passed the accessing point in series comprising,

(a) arranging data units in the cyclic store so that units of data that follow each other in the expected accessing sequence are not in adjacent storage locations but are separated from one another by at least one other storage location containing another unit of data so as to place the unit of data expected to be accessed next where it can be reached at the slower cyclic speed in the mean time between two accesses,

(b) recording an actual accessing sequence of the units of data,

(c) operating the cyclic memory at the fast cyclic speed between accesses until the unit of data occurring next the recorded actual accessing sequence is moved to a position where it can be reached at the slow cyclic speed in the mean time between two accesses,

(d) operating the cyclic memory at the slow cyclic speed after step c and until the next access and

(e) operating the memory at the fast cyclic speed while the unit of data requested by said next access approaches the accessing point.

4,400,794

MEMORY MAPPING UNIT

Larry W. Koos, Orlando, Fla., assignor to Burroughs Corporation, Detroit, Mich.

Filed Nov. 17, 1981, Ser. No. 322,118

Int. Cl.³ G06F *13/00;* **G11C** *5/06, 7/00*

U.S. Cl. 364—900 **5 Claims**

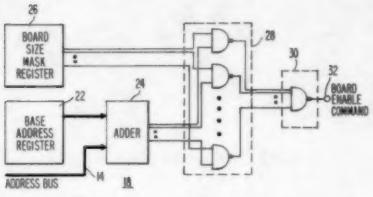
1. A memory mapping unit used to map a 2^K size memory board to any 2^N address boundary, for a 2^M memory space having a M bit address buss connected in parallel to each memory board, the 2^K memory board can range in size from

$N \leqq K \leqq M$, each memory board mapping unit is associated with a particular memory board and produces a board enable command when the address carried by the address buss identifies the location on the memory board, comprising:

a base address register containing at least (M−N) bits for storing the 2's complement of the base address of the memory board;

an adding means connected to said base address register and the address buss for adding the value of the base address register with the upper (M−N) bits of the memory address;

a board size mask register containing at least (M−N) bits for masking out bits which are not useful for a particular



board size such that for a 2^K board, the first (K−N) least significant bits in said board size register should be "zero" and the upper (M−K) bits should be "one";

a first logical means connected to said adding means and said board size mask register for performng an AND operation on each bit in said adding means with it's corresponding bit position in said board size mask register; and

a second logical means connected to said first logical means for performing a NOR operation on the outputs from said first logical means and producing said board enable command when all of said outputs are in a predetermined logic condition, which turns on the memory board when the memory address identifier is located on the board.

4,400,795

MAGNETIC BUBBLE MEMORY DEVICE

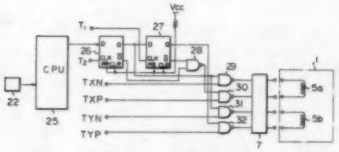
Syouzi Irie, and Osamu Hirakawa, both of Suzaka, Japan, assignors to Fujitsu Limited, Kawasaki, Japan

Filed Aug. 28, 1981, Ser. No. 297,265

Claims priority, application Japan, Sep. 1, 1980, 55-123080[U]

Int. Cl.³ G11C *19/08*

U.S. Cl. 365—1 **10 Claims**



1. A magnetic bubble memory device comprising:

a main bubble memory apparatus having a bubble actuating circuit and a holder;

a magnetic bubble memory cassette which is inserted into said holder so as to be electrically connected with said bubble actuating circuit provided in said main apparatus;

detector means for detecting the operation of disconnecting said magnetic bubble memory cassette from said holder, said detector means including means for transmitting a signal for stopping the bubble motion caused by said bubble actuating circuit in advance of the disconnection of said magnetic bubble memory cassette from said bubble actuating circuit.

4,400,796

TEMPERATURE COMPENSATED SENSE AMPLIFIER

Thomas A. Closson, Dallas; David B. Oxford, Garland; Stephen R. Schenck, McKinney, and Jerold A. Seitchik, Dallas, all of Tex., assignors to Texas Instruments Incorporated, Dallas, Tex.

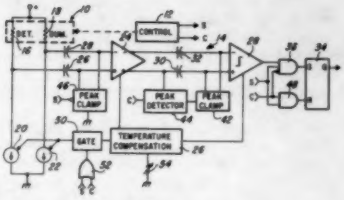
Division of Ser. No. 90,958, Nov. 5, 1979, Pat. No. 4,261,044.

This application Dec. 22, 1980, Ser. No. 218,995

The portion of the term of this patent subsequent to Apr. 7, 1998, has been disclaimed.

Int. Cl.³ G11C *19/08*

U.S. Cl. 365—8 **8 Claims**



1. A sense amplifier for providing a trigger signal output, said sense amplifier comprising:

current source means for providing a flow of current at a level determined by a reference voltage through each of first and second conductors to develop respective voltages therefor;

amplifier means having first and second inputs connected to said current source means via said first and second conductors for providing an intermediate output signal proportionally greater than the differential signal developed between said first and second inputs from the respective voltages of said first and second conductors;

comparator means connected to the output of said amplifier means for providing the trigger signal output in response to the intermediate output signal from said amplifier means exceeding a predetermined threshold voltage; and

temperature compensation means connected to said current source means for providing the reference voltage thereto at a voltage magnitude determined by the temperature sensed by said temperature compensation means.

4,400,797

READ ONLY MEMORY USING STATIC INDUCTION TRANSISTOR

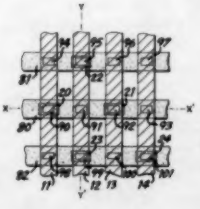
Eiichi Iwanami, Tokyo, Japan, assignor to Kabushiki Kaisha Daini Seikosha, Tokyo, Japan

Filed Nov. 25, 1980, Ser. No. 210,316

Claims priority, application Japan, Dec. 6, 1979, 54/158407

Int. Cl.³ G11C *11/40*

U.S. Cl. 365—174 **12 Claims**



1. A read only memory using static induction transistors, comprising:

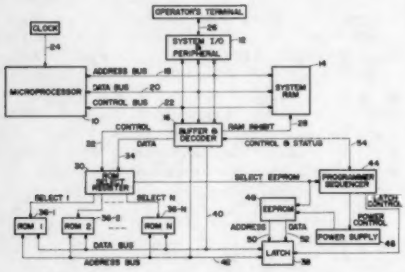
a semiconductor substrate having one conductivity type;
an epitaxial semiconductor layer formed on a major surface of said semiconductor substrate and having the same conductivity type as that of said semiconductor substrate and a lower impurity density than that of said semiconductor substrate;
a plurality of word lines formed in a surface portion of said epitaxial layer and comprising regions of semiconductor material having a conductivity type opposite that of said semiconductor substrate, said word lines having openings therethrough extending down to said epitaxial layer and filled with epitaxial layer material;
regions of semiconductor material having the same conductivity type as that of said semiconductor substrate formed in selected portions of the epitaxial layer material filling the openings through said word lines;
a plurality of bit lines overlying and intersecting said word lines and contacting at said regions of semiconductor material formed in said selected portions of the epitaxial layer material filling the openings through said word lines; wherein
said substrate, one of said word lines, the epitaxial layer material within the opening extending through said one word line and said region of semiconductor material in the epitaxial layer material within the opening extending through said one word line respectively comprise a source, gate, channel and drain of a static induction transistor.

4,400,798

MEMORY PATCHING SYSTEM

Robert S. Francis, Beaverton, and Bruce C. Stofer, Hillsboro, both of Oreg., assignors to Tektronix, Inc., Beaverton, Oreg.

Filed Jul. 13, 1981, Ser. No. 282,367
Int. Cl.³ G11C *11/34*
U.S. Cl. 365—174 **9 Claims**



1. A memory patching system, comprising;
a first memory containing permanent type information;
a second memory containing patch information;
a third memory; and
control means for transferring contents of said first memory to said third memory, and modifying contents of said third memory in accordance with contents of said second memory.

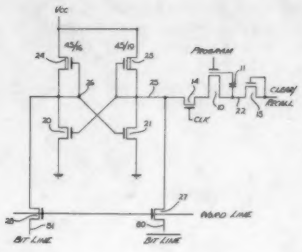
4,400,799

NON-VOLATILE MEMORY CELL

Keith H. Gudger, San Jose, Calif., assignor to Intel Corporation, Santa Clara, Calif.

Filed Sep. 8, 1981, Ser. No. 300,000
Int. Cl.³ G11C *11/40*
U.S. Cl. 365—95 **13 Claims**

1. A nonvolatile memory cell comprising:
a bistable memory cell having at least one input/output node;
means coupled to said bistable cell for causing said bistable cell to assume a predetermined one of its stable states when power is applied to said cell;
an electrically programmable and electrically erasable (E^2) memory cell having two terminals, one of said terminals being coupled to said input/output node of said bistable cell; and,



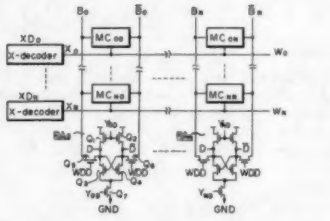
a control line for controlling the clearing of said E^2 cell and the recalling of information from said E^2 cell, said line being coupled to the other terminal of said E^2 cell;
whereby a memory cell is realized which has the capability to store information in the absence of power.

4,400,800

SEMICONDUCTOR RAM DEVICE

Setsuo Kurafuji, Yokohama, Japan, assignor to Fujitsu Limited, Kawasaki, Japan

Filed Nov. 26, 1980, Ser. No. 210,663
Claims priority, application Japan, Nov. 29, 1979, 54-154578
Int. Cl.³ G11C *11/40*
U.S. Cl. 365—190 **9 Claims**



1. A semiconductor RAM device having a matrix of rows corresponding to word lines and columns corresponding to bit lines, and static type memory cells, respective of the static type memory cells operatively connected at corresponding of the cross points of said matrix,
a row decoder having outputs respectively, operatively connected to corresponding ones of said rows;
a column decoder having outputs respectively, operatively connected to corresponding ones of said columns;
each of said static type memory cells being selected by the respective output from the row decoder and the respective output from the column decoder and generating a data signal in response to being selected, said semiconductor RAM device comprising:
amplifier circuits, having activated and non-activated states, respective of said amplifier circuits operatively connected to corresponding of said bit lines, for amplifying the data signal from a selected one of said static type memory cells associated with said corresponding bit lines, and
gate circuits having activated and non-activated states, respective of said gate circuits operatively connected be-

tween said corresponding bit lines and said respective amplifier circuits, said gate circuits being activated for a first specified period after a respective memory cell is selected by said output from said row decoder and said output from said column decoder and passing the data signal from said respective memory cell to said corresponding amplifier circuit,

said amplifier circuit being selectively activated for a second specified period after said first specified period.

4,400,801

READ/WRITE CIRCUIT FOR A RANDOM ACCESS MEMORY

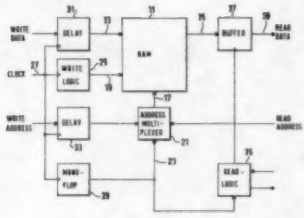
Dieter Kible, Gärtringen, Fed. Rep. of Germany, assignor to Hewlett-Packard GmbH, Boeblingen, Fed. Rep. of Germany

Filed Dec. 4, 1980, Ser. No. 213,131

Claims priority, application Fed. Rep. of Germany, Dec. 22, 1979, 2952056

Int. Cl.³ G11C *7/00*

U.S. Cl. 365—195 **7 Claims**



1. A read/write circuit for a random access memory including an output circuit, the read/write circuit comprising:

write logic means having an input for receiving a write request signal and coupled to the memory for supplying write signals thereto;

switching means having an input for receiving the write request signal and coupled to the memory for selectively supplying write or read address signals to the memory;

read logic means, coupled to the switching means and the memory output circuit and having inputs for receiving a read request signal and a read select signal, for initiating the reading of information from the memory in response to a read request signal and a read select signal and for reinitiating the reading of information from the memory in response to a read select signal when the reading of information was previously terminated before completion; and

priority circuit means having an input for receiving the write request signal and coupled to the switching means and the read logic means for permitting the switching means to supply a write address signal to the memory, for supplying the read select signal to the read logic means in the absence of a write request signal, and for preventing the initiation of reading of information from the memory and terminating any currrent reading of information from the memory in response to the write request signal.

4,400,802

INTEGRATED DIGITAL SEMICONDUCTOR CIRCUIT

Peter Rydval, Munich, Fed. Rep. of Germany, assignor to Siemens Aktiengesellschaft, Berlin and Munich, Fed. Rep. of Germany

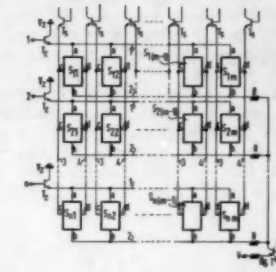
Filed Feb. 3, 1981, Ser. No. 231,005

Claims priority, application Fed. Rep. of Germany, Feb. 7, 1980, 3004565

Int. Cl.³ G11C *7/00, 7/02*

U.S. Cl. 365—226 **5 Claims**

1. Integrated digital semiconductor circuit, comprising n terminals, a common constant current source for supplying said terminals, said current source being in the form of a transistor having a current supplying output, each of said terminals being operable in an identical logic level "1" in one operating state and each of said terminals being operable in an identical logic level "0" in another operating state, the digital semiconductor circuit being operable in one operating state in which all of said terminals are at the logic level "0" and in remaining operating states in which a given partial number of said terminals are at the logic level "1" and the others of said terminals are at the logic level "0", n equal resistors each being connected between said current supplying output and a respective one of said terminals, said resistors forming an exclusive connection between said constant current source and said terminals, said resistors having resistance values R being adjustable according to the formula:



$$R = \frac{U \cdot (n + k - 1)}{I \cdot (k - 1)}$$

where U is the voltage excursion between the logic level "0" and the logic level "1", k is the ratio between the current flowing through one of said terminals at the logic level "1" and the current flowing through the one terminal at the logic level "0", and I is the value of the total current flowing through all of said terminals in said operating states.

4,400,803

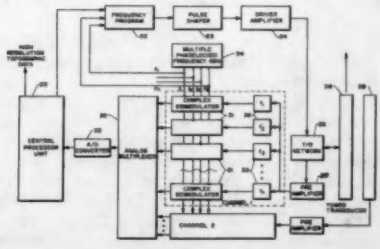
WIDE SWATH PRECISION ECHO SOUNDER

Fred N. Spiess, and Victor C. Anderson, both of San Diego, Calif., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed May 26, 1981, Ser. No. 267,168

Int. Cl.³ G01S *15/89, 7/54*

U.S. Cl. 367—88 **6 Claims**



1. A wide swath precision echo sounder for providing topographic profiles of a target area with high spatial resolution comprising:

moving transmitter means for transmitting a plurality of

programmed acoustic pulses substantially perpendicular to the direction of motion of said transmitting means,

said moving transmitter means including multiple frequency generating means, frequency programming means and control circuit means, said frequency programming means being coupled to said multiple frequency generating means and to said control circuit means for sequencing said acoustic pulses, where each pulse of said plurality of programmed acoustic pulses is transmitted at a different frequency and to cause the extended reflected signals from the target area to overlap each other in time,

dual receiving means for receiving the backscattered energy from said target area, and

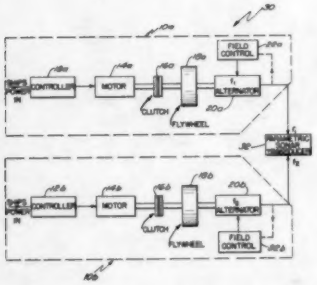
synthetic aperture and interferometer circuit means coupled to said dual receiving means for processing sequences of said received energy from said target area to provide a numerical measure of the depths and lateral ranges to the particular points of target area from which said backscattered energy was reflected.

4,400,804

DRIVER FOR HIGH POWER SONAR SYSTEMS

William L. Konrad, Niantic, Conn., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Sep. 14, 1981, Ser. No. 301,488
Int. Cl.³ G01S 7/52; G10K 11/00
U.S. Cl. 367—137 **3 Claims**



1. A high power sonar system driver comprising:

controller means, adapted to receive low power, for regulating said low power;

electric motor means for receiving said low power from said controller means and converting said low power to rotary shaft motion;

clutch means for receiving said rotary shaft motion from said electric motor means and selectively transmitting said rotary shaft motion;

rotating flywheel means for receiving said rotary shaft motion from said clutch means and converting said rotary shaft motion to stored rotational kinetic energy;

high frequency alternator means for receiving said stored rotational kinetic energy from said rotating flywheel means and converting said rotational kinetic energy to a high power FM pulse;

field control means for monitoring said high power FM pulse and keying said high power FM pulse to the rotational velocity of said rotating flywheel means; and

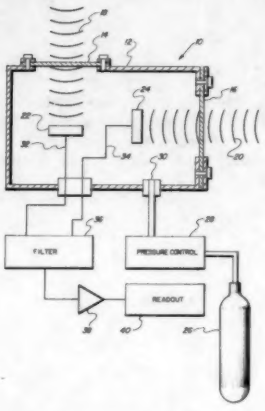
sonar transducer means for receiving said high power FM pulse from said high frequency alternator means and radiating said FM pulse as a high strength acoustic signal.

4,400,805

ACOUSTICALLY FILTERED TRANSDUCER

Harry Nadler, Thousand Oaks, Calif., assignor to Rockwell International Corporation, El Segundo, Calif.

Filed Apr. 27, 1981, Ser. No. 257,840
Int. Cl.³ H04R 1/28, 17/10
U.S. Cl. 367—140 **6 Claims**



1. An acoustic transducer, comprising:

a pressure tight vessel;

a compressible fluid disposed within said vessel;

an electromechanical transducer disposed within said vessel at an antinode of a characteristic resonance pattern for said fluid within said vessel; and

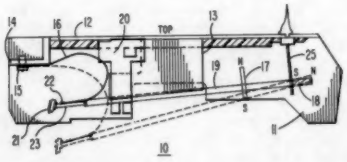
a port communicating with the interior of said vessel for changing the pressure of said fluid within said vessel.

4,400,806

PICKUP ARM SUSPENSION FOR VIDEO DISC CARTRIDGE

Ernest T. Manson, Indianapolis, and Byron K. Taylor, Carmel, both of Ind., assignors to RCA Corporation, New York, N.Y.

Filed Mar. 29, 1982, Ser. No. 363,391
Int. Cl.³ G11B 9/06, 3/52
U.S. Cl. 369—170 **11 Claims**



1. A structure for suspending a stylus arm in a cartridge enclosure comprising:

a contiguous element formed from compliant material having a flat rectangular member, said member being relatively long compared to its width and relatively wide compared to its thickness and having an aperture in the vicinity of a first end thereof for receiving said stylus arm, said member having a section of narrowed width located near said aperture between the first end and a second end;

first and second expanded regions separated by a section, the second expanded region being contiguous with the second end of said flat rectangular member, and wherein the element is affixed to said cartridge by compressing the

first expanded region to permit passage thereof through a hole in said cartridge enclosure, thereafter allowing said first expanded region to re-expand, the first and second expanded regions residing on either side of the hole in the cartridge body in a compressive state.

4,400,807

STYLUS POSITION DETECTING APPARATUS

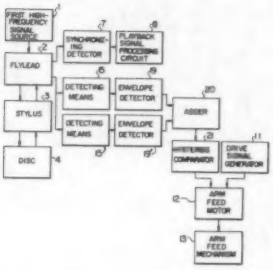
Tokinori Furuichi, Yokohama; Junichi Ikoma, Yokosuka; Masao Oguri, Yokohama; Yoshio Miura, Yokohama, and Keizo Shimizu, Yokohama, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Nov. 13, 1981, Ser. No. 321,761

Claims priority, application Japan, Nov. 14, 1980, 55-159489

Int. Cl.³ G11B *9/06, 21/10*

U.S. Cl. 369—220 **3 Claims**



1. A stylus position detecting apparatus for controlling an arm servo system of a disc player in which a high frequency signal is led from a high frequency signal source to a stylus electrode and a change of capacitance between said stylus electrode and a disc is taken out in the form of an information signal, said stylus position detecting apparatus comprising:

detecting means positioned at the both sides of a conductor connecting the output of said high frequency signal source to said stylus electrode for detecting leakage components of the high frequency signal flowing through said conductor;

means for supplying a reference potential;

a detector circuit which detects a signal detected by said detecting means to positive and negative directions with respect to said reference potential; and

adding means for adding two voltages obtained by the detections to said positive and negative directions to produce a stylus position detecting signal.

4,400,808

ROTARY RECORDING MEDIUM REPRODUCING APPARATUS

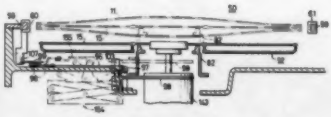
Takashi Saito, Ayase; Toshio Hirano, Atsugi, and Takashi Kumaki, Sagamihara, all of Japan, assignors to Victor Company of Japan, Ltd., Yokohama, Japan

Filed Aug. 19, 1981, Ser. No. 294,360

Claims priority, application Japan, Aug. 20, 1980, 55-117737; Aug. 20, 1980, 55-117739; Aug. 20, 1980, 55-117741

Int. Cl.³ G11B *17/04, 25/04*

U.S. Cl. 369—262 **6 Claims**



1. A rotary recording medium reproducing apparatus for reproducing a rotary recording medium accommodated within a case, said case comprising a jacket provided with a space for accommodating said rotary recording medium and an opening for allowing said rotary recording medium to go in and out of said jacket, and a lid member inserted through said opening of said jacket for closing said opening of said jacket, said rotary recording medium reproducing apparatus comprising:

an inserting opening through which said case is inserted;

a turntable for rotating said rotary recording medium;

lid member locking means and rotary recording medium clamping means respectively provided at an innermost part of said reproducing apparatus opposite to said inserting opening with respect to said turntable;

jacket opening enlarging means provided in the vicinity of said inserting opening, capable of moving over said turntable between a position in the vicinity of said inserting opening and said innermost part of said reproducing apparatus, in response to an operation in which said case is inserted into and pulled out from said reproducing apparatus;

elevator means for raising and lowering a rotary recording medium supporting member for supporting said rotary recording medium, independently from said turntable;

an elevator motor for operating said elevator means, said elevator motor operating so that said support member is at a raised position due to the operation of said elevator means upon insertion of said case into said reproducing apparatus; and

an elevator lever member provided respective of said elevator means, for operating said elevator means by operating independently from said elevator motor,

said elevator lever member being positioned within a moving passage of a locking guiding part which is a part of said jacket opening enlarging means,

said elevator lever member being locked and guided by said locking guiding part and displaced towards a direction so as to operate said elevator means to lower said supporting member so that said supporting member retreats from a case inserting path upon insertion of said case into said reproducing apparatus, and being released of the locking operation by said locking guiding part and displaced towards an opposite direction so as to operate said elevator means to raise said supporting member upon extraction of said case from said reproducing apparatus.

4,400,809

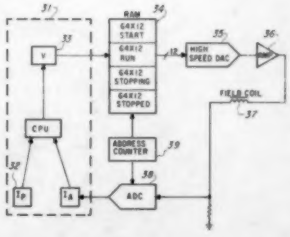
ARBITRARY DRIVE FOR MAGNETIC FIELD WAVEFORM CONTROL

Robert J. Whitinger, Richardson, Tex., assignor to Texas Instruments Incorporated, Dallas, Tex.

Filed Mar. 2, 1981, Ser. No. 239,280

Int. Cl.³ G01R *31/28;* **G11C** *29/00*

U.S. Cl. 371—27 **14 Claims**



1. An apparatus for controlling magnetic fields in one or more spatial axes comprising:

(a) means for inducing magnetic fields in one or more spatial axes;

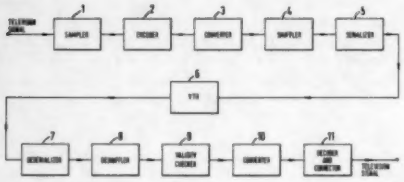
(b) means for controlling said induced magnetic fields utilizing a set of programmed increments in digital format;
(c) means for sensing said induced magnetic fields; and
(d) means connected to said means for controlling and to said means for sensing said induced magnetic fields for modifying said induced magnetic fields in a closed loop feedback system such that said sensed magnetic fields are made to more closely resemble said set of programmed increments.

4,400,810

PROCESSING BINARY DATA

John G. S. Ive, London, England, assignor to Sony Corporation, Tokyo, Japan

Filed Apr. 24, 1981, Ser. No. 257,393
Claims priority, application United Kingdom, May 1, 1980, 8014487
Int. Cl.³ G06F *11/10*
U.S. Cl. 371—40 **14 Claims**



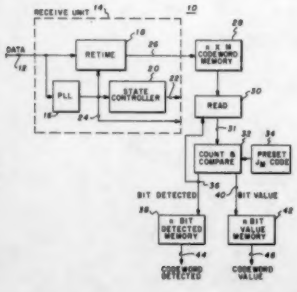
1. A method of processing binary data comprising dividing the data into blocks of m words each of n bits, deriving an n-bit parity word each digit of which is a parity digit for the corresponding digits of said m words, deriving an n-bit check word by binary full-addition summing said m words and forming said check word as the n least significant bits of the resulting binary sum, subjecting to further processing said block of words including said parity word and said check word, checking the validity of each of the words, using said parity word and said check word to detect and correct at least some of the errors occurring in said m words during said further processing, and concealing any error which cannot be corrected.

4,400,811

DETECTING ACCURRENCES OF REDUNDANT DIGITAL CODEWORDS

James H. Brown, Garland, and Johannes Grande, Richardson, both of Tex., assignors to Rockwell International Corporation, El Segundo, Calif.

Filed Apr. 8, 1981, Ser. No. 252,094
Int. Cl.³ G06F *11/08, 7/02*
U.S. Cl. 371—69 **11 Claims**



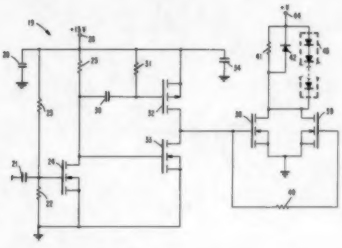
1. A method for detecting redundant digital codewords repeatedly transmitted over a digital transmission system, comprising determining the values of bits in corresponding bit-positions of consecutive n bit codewords and providing, in response to said values, a codeword detected signal when there are at least J_M equal bit values for each of the n bit-positions of the codewords, in M consecutive codewords, where J_M is a preselectable threshold less than M.

4,400,812

LASER DRIVE CIRCUITS

L. Dale Clark, and William J. Archambeault, both of Goleta, Calif., assignors to Santa Barbara Research Center, Goleta, Calif.

Filed Jun. 15, 1981, Ser. No. 273,898
Int. Cl.³ H01S *3/13*
U.S. Cl. 372—29 **8 Claims**



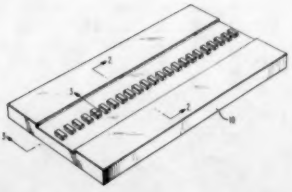
1. Circuitry for producing a high-current, short-pulsewidth drive signal to a laser source in response to a low-voltage, short-pulsewidth command signal, said circuitry comprising:
a VMOS amplifier stage comprising a VMOS transistor which amplifies the voltage level of said command signal to a predetermined voltage level;
a complementary driver stage coupled to said amplifier stage comprising a plurality of VMOS transistors arranged in a push-pull manner for providing a high-current capacity output signal in response to said amplified command signal; and
an output stage coupled to said driver stage and to said laser source for receiving and amplifying said high-current capacity output signal in order to apply an amplified output signal to said laser source as the drive signal of said laser source, said drive signal being a high-power, short-pulsewidth signal, the duration of said drive signal being determined by said command signal.

4,400,813

CRENELATED-RIDGE WAVEGUIDE LASER

Ivan P. Kaminow, Holmdel, N.J., assignor to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed Jul. 20, 1981, Ser. No. 285,253
Int. Cl.³ H01S *3/19*
U.S. Cl. 372—45 **8 Claims**



1. In a ridge-type semiconductor laser comprising a substrate having a plurality of epitaxially grown layers one of which

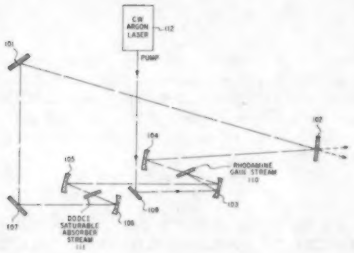
includes an active layer containing a pn-junction, a ridge structure epitaxially grown and fabricated on said plurality of epitaxial layers, and means for providing current to said pn-junction in said active layer, said current being confined in a lateral dimension by said ridge structure, characterized in that said ridge structure is notched in regions at longitudinal periodic intervals, and said means for providing current couples said current into said active layer only in regions corresponding to the portions of said ridge that are not notched.

4,400,814

SUBPICOSECOND RING LASER

Richard L. Fork, Middletown; Benjamin I. Greene, Matawan, and Charles V. Shank, Holmdel, all of N.J., assignors to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed May 1, 1981, Ser. No. 259,548
Int. Cl.³ H01S *3/083*
U.S. Cl. 372—94 **11 Claims**



1. A ring laser for generating subpicosecond optical pulses comprising:

means forming an optical ring cavity,

a gain medium and an optical absorber medium positioned at different locations within said ring cavity, and

means for pumping said gain medium to create lasing action in the form of said pulses, each of said pulses propagating through said absorber medium and having therein a spatial length equal to the product of the pulse time-duration measured at half the maximum pulse amplitude times the velocity of light in said absorber medium,

characterized in that

said laser is adapted to generate at least two counterpropagating pulses which overlap in said absorber medium, and the length of the optical path of said pulses in said absorber medium is approximately equal to or less than the spatial length of said pulses therein.

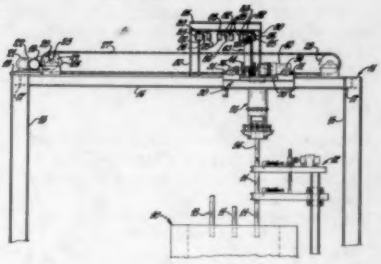
4,400,815

ELECTRODE ALIGNING APPARATUS

Charles S. Dunn, Pataskala, and Stephen Seng, Bladensburg, both of Ohio, assignors to Owens-Corning Fiberglas Corporation, Toledo, Ohio

Filed Jan. 26, 1982, Ser. No. 342,854
Int. Cl.³ H05B *7/14*
U.S. Cl. 373—92 **9 Claims**

1. A trolley mechanism for aligning a replacement electrode with a vertical working electrode for threaded end-to-end engagement therewith, the working electrode being installed in an electric arc melter, comprising a pair of fixed, parallel, spaced guide rails generally overlying the furnace and laterally spanning the electrode location; a trolley frame spanning the guide rails and guided thereby for movement; means for moving said trolley frame longitudinally along said guide rails into substantial transverse alignment with the working electrode location; a trolley carried by said trolley frame for movement relative to the frame, electrode carrying means on said trolley, means for moving said trolley relative to said trolley frame transversely toward the electrode location, a vertical mast mounted on said trolley for movement therewith; interengaging means on said mast and said guide rails to position said trolley in precise alignment with said working electrode; and a



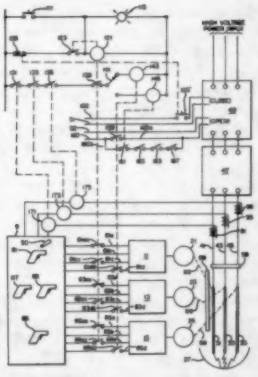
fixed stop located on said guide rail and engageable by said mast to precisely position said trolley with said electrode carrying means in vertical alignment with said working electrode.

4,400,816

CONTROLLED STOP CIRCUIT FOR FURNACES

Arthur P. Robare, McMinnville, Oreg., assignor to Cascade Steel Rolling Mills, Inc., McMinnville, Oreg.

Filed Apr. 27, 1982, Ser. No. 372,150
Int. Cl.³ H05B *0/00*
U.S. Cl. 373—104 **5 Claims**



4. In a control circuit for the electrodes of an electric arc furnace,

drive means for raising the electrodes thereby decreasing the current drawn by them or for lowering the electrodes,

brake means for stopping travel of the electrodes,

power switch means having a closed position to supply current to the electrodes, and an open position to cut off said supply,

sensing means for sensing the current supplied to the electrodes,

plural switch means for activating or deactivating said drive means,

control switch means effecting opening or closing of said power switch means,

activating means for activating said brake means at the predetermined upper positions of the electrodes,

independent switch means so interrelated to all of the above

means, that when said independent switch means is moved to its operable position it

(a) causes the electrodes to rise, independently of said plural switch means,

(b) responds to a predetermined decreased current value to cause said power switch means to open independently of said control switch means, and to cause actuating of said brake means independently of said activating means.

4,400,817

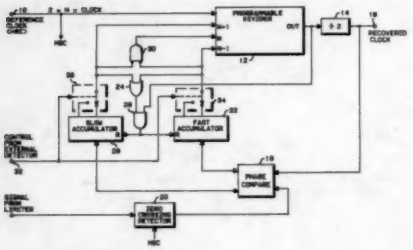
METHOD AND MEANS OF CLOCK RECOVERY IN A RECEIVED STREAM OF DIGITAL DATA

Terence E. Sumner, Roselle, Ill., assignor to Motorola, Inc., Schaumburg, Ill.

Filed Dec. 30, 1980, Ser. No. 221,190

Int. Cl.³ H03B *3/06*

U.S. Cl. 375—119 **6 Claims**



3. A circuit for obtaining from a high-speed clock input a recovered clock signal at a frequency lower than the high-speed clock frequency, the recovered clock signal synchronized in frequency and locked in phase with a received digital signal, the circuit comprising:

a. a programmable divider receiving the high-speed clock input and having a certain predetermined number by which said divider divides said high-speed clock input to produce the recovered clock signal;

b. means for comparing phase of the recovered clock signal with phase of the received digital signal and for generating fast signals if the recovered clock signal is slow with respect to the received digital signal and slow signals if the recovered clock signal is leading with respect to the received digital signal;

c. first counting means for accumulating a slow count consisting of said slow signals and a second counting means for accumulating a fast count consisting of said fast signals; and

d. means for changing said certain predetermined number to a smaller number when said slow count reaches a first predetermined number and to a larger number when said fast count reaches a second predetermined number.

4,400,818

ROTARY SWITCH SIMULATOR

Ira P. Shapiro, Phoenixville, Pa., assignor to Burroughs Corporation, Detroit, Mich.

Filed Jan. 29, 1981, Ser. No. 229,551

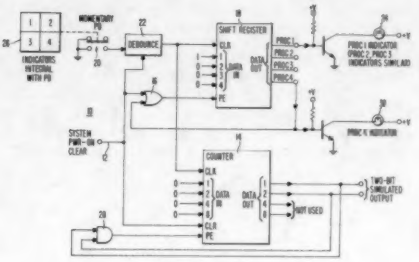
Int. Cl.³ G06M *3/06*

U.S. Cl. 377—54 **12 Claims**

1. An apparatus for simulating an n-position rotary-type switch, said apparatus providing an ordered set of n outputs, a next sequential one of said n outputs being selected each time said apparatus is actuated, the sequence of outputs selected being repeated after n actuations of said apparatus, said apparatus comprising:

input means for initiating the actuation of said apparatus to its next sequential position;

shift register means, responsive to said input means, for specifying which one of said n sequential positions is selected; and



enabling means, responsive to the selected one of said n sequential positions from said shift register means, for enabling a preset of said shift register means for subsequently loading a set of preset data into said shift register means upon the n^{th} actuation of the said input means to repeat the said sequence.

4,400,819

DEVICE FOR THE ACCURATE ANATOMICAL LOCATING OF TOMODENSITOMETRIC SECTIONS

Jean Bens; Marcel Bloch; Rene Chekroun, and Remy Klausz, all of Paris, France, assignors to Compagnie Generale de Radiologie, Paris, France

Filed Apr. 21, 1980, Ser. No. 142,474

Claims priority, application France, Apr. 23, 1979, 79 10211

Int. Cl.³ G01N *23/02*

U.S. Cl. 378—20 **19 Claims**

1. A method for using a tomodensitometer for making tomodensitometric images of tomodensitometric sections of a subject, said sections being spaced from one another in a first direction, said tomodensitometer including at least one elongated element having a longitudinal axis, said elongated element being formed at least partly from a material visible on said tomodensitometric sections, said elongated element comprising in cross section at least one characteristic having a magnitude varying substantially continuously along said longitudinal axis of said elongated element, said method comprising the steps of:

using said at least one elongated element by disposing said at least one elongated element on said subject such that at least a portion of said longitudinal axis has a component which is disposed along a second direction perpendicular to the plane of each of said images; and

using said tomodensitometer to form said images,

whereby said elongated element forms a trace on each of said images, said trace having variations due to said at least one varying characteristic, and

using said trace variations to accurately anatomically locate each of said sections.

4,400,820

AXIAL TOMOGRAPHY HEAD HOLDER

William R. O'Dell, Milwaukee, and Christine M. Fletcher, Madison, both of Wis., assignors to General Electric Company, Schenectady, N.Y.

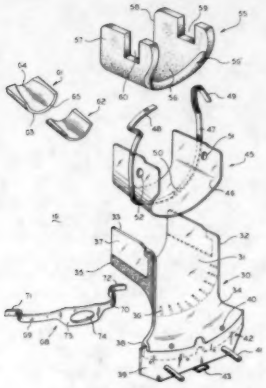
Filed Sep. 30, 1982, Ser. No. 430,149

Int. Cl.³ A61B *6/00, 19/00;* **A61F** *13/00*

U.S. Cl. 378—209 **15 Claims**

14. A head holder for stabilizing the head of a subject lying on a body supporting cradle, the holder comprising:

a preformed U-shaped member comprised of a longitudinally extending concave bottom wall and laterally spaced apart side walls projecting, respectively, from opposite sides of the bottom wall whereby to define an inside space for containing the head of the subject, said member being composed of X-ray transmissive resilient foam material having sufficient durometer for said member to maintain its preformed shape when it is not subjected to external forces,



head restraint means comprised of a sheet of X-ray transmissive material that is generally conforming to the contour of the outside of said preformed foam U-shaped member,

a strap fastened intermediate of its ends to said head restraint means to enable wrapping said strap across the front of the head of the subject that is positioned in said resilient U-shaped foam member, and

means for fastening the ends of the strap to said cradle.

4,400,821

APPARATUS FOR THE MEASUREMENT OF THE X-RAY TUBE HIGH VOLTAGE

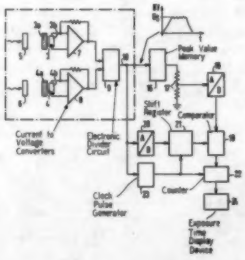
Horst Aichinger, Fuerth, and Heinz E. Kranberg, Erlangen, both of Fed. Rep. of Germany, assignors to Siemens Aktiengesellschaft, Berlin & Munich, Fed. Rep. of Germany

Filed Mar. 31, 1982, Ser. No. 363,768

Claims priority, application Fed. Rep. of Germany, Apr. 10, 1981, 3114699

Int. Cl.³ H05G *01/26, 01/28*

U.S. Cl. 378—97 **2 Claims**



1. Apparatus for the measurement of the x-ray tube high voltage of an x-ray diagnostic system, said apparatus including x-ray filters of different absorption, radiation detectors (3, 4) which are covered on their input sides for the radiation by the respective x-ray filters (5, 6) of different absorption, and a divider (9) for the output signals of the radiation detectors (3, 4) characterized in that a time measurement circuit is connected with the output of the divider (9) said time measurement circuit (16 through 24) comprising means for detecting the exposure time while the x-ray tube voltage is greater than or equal to a predetermined value.

4,400,822

X-RAY DIAGNOSTIC GENERATOR COMPRISING TWO HIGH VOLTAGE TRANSFORMERS FEEDING THE X-RAY TUBE

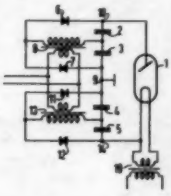
Hermann Kühnke, Aurachtal, and Manfred Rattner, Buckenhof, both of Fed. Rep. of Germany, assignors to Siemens Aktiengesellschaft, Berlin & Munich, Fed. Rep. of Germany

Filed Nov. 12, 1980, Ser. No. 206,135

Claims priority, application Fed. Rep. of Germany, Dec. 20, 1979, 7935945[U]

Int. Cl.³ G03B *41/16*

U.S. Cl. 378—103 **2 Claims**



1. An x-ray diagnostic generator comprising: an x-ray tube, two high voltage transformers disposed in a common plane feeding the x-ray tube having respective secondary parts, two doubler circuits for the output voltage, one connected with each of said high voltage secondary parts, the doubler circuits comprising rectifiers and capacitors, a single oil-filled receptacle, and a flat base plate having a radiation exit window centrally disposed therein; said x-ray tube, said two high voltage transformers and said doubler circuits being disposed in said single oil-filled receptacle, said radiation exit window being aligned with said x-ray tube and disposed at one side of said x-ray tube for transmitting x-radiation therefrom, said two high voltage transformers being disposed adjacent respective opposite ends of the x-ray tube and symmetrically relative to the radiation exit window, the rectifiers and capacitors being disposed on an opposite side of the x-ray tube and being remote from and symmetrically disposed relative to the radiation exit window, the two high voltage transformers being mounted on said base plate adjacent respective opposite ends thereof, the x-ray tube being mounted on said base plate and offset in a direction parallel to said common plane from the two high voltage transformers, the rectifiers and capacitors being disposed on the side of the x-ray tube remote from said base plate and being supported in conjunction with the opposite ends of said high voltage transformers at a distance from said base plate, and a removable housing mating with said base plate for enclosing and defining said oil-filled receptacle.

4,400,823

X-RAY DIAGNOSTIC INSTALLATION FOR RADIOGRAPHY AND FLUOROSCOPY

Joerg Haendle, Erlangen, Fed. Rep. of Germany, assignor to Siemens Aktiengesellschaft, Berlin & Munich, Fed. Rep. of Germany

Filed Jun. 12, 1981, Ser. No. 273,238

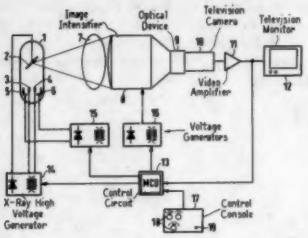
Claims priority, application Fed. Rep. of Germany, Jul. 2, 1980, 3025107

Int. Cl.³ H05G *1/30, 1/46*

U.S. Cl. 378—113 **3 Claims**

1. An X-ray diagnostic installation for radiography and

fluoroscopy comprising: an X-ray tube, a television installation for the transmission of the X-ray image, focus size control means for controlling the size of the focus of the X-ray tube, and dose rate means for generating at least one output value during fluoroscopy, said focus size control means comprising at least one control electrode (5, 6) for determining the focus size via the electrode potential, a control voltage generator (15) connected with the control electrode for controlling the electrode potential, and a control circuit (13) connected with said control voltage generator (15), said control circuit having storage means (22, 23) for storing said fluoroscopy output



value, the maximum load for said X-ray tube, and selected radiography values, said control circuit further having an arithmatic unit connected to said storage means for computing an electrode potential based on the contents of said storage means for operating said control voltage generator for establishing a focus size during radiography which is substantially the smallest the value in combined dependence upon said output value, said maximum load of the X-ray tube (1), and said selected radiography values, and an operating console (17) connected to said control circuit (13) having an adjustment means (18) for manual selection of said radiography values.

4,400,824

X-RAY TUBE WITH SINGLE CRYSTALLINE COPPER TARGET MEMBER

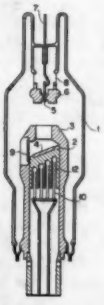
Tokihiko Shidara, Yokohama, Japan, assignor to Tokyo Shibaura Denki Kabushiki Kaisha, Kawasaki, Japan

Filed Feb. 11, 1981, Ser. No. 233,432

Claims priority, application Japan, Feb. 12, 1980, 55-14763; Feb. 12, 1980, 55-14764

Int. Cl.³ H01J *1/38, 35/08*

U.S. Cl. 378—141 **4 Claims**



1. An X-ray tube comprising a sealed envelope, a cathode disposed inside said sealed envelope, and an anode sealed to part of said sealed envelope and comprising an anode substrate of copper and a target member fixed to a surface of said anode substrate, at least that portion of said anode substrate which adjoins said target member being substantially made of single crystalline copper.

4,400,825

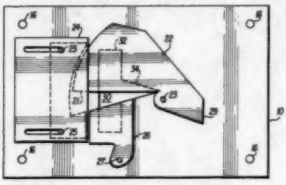
ADJUSTABLE SLIT RADIOGRAPHIC APPARATUS

John J. Boggi; Gerald V. Centrone, both of Williamstown; Aaron M. Dolin, Delran, all of N.J., and Ira N. Sherman, Cincinnati, Ohio, assignors to General Electric Co., Phila., Pa.

Filed May 3, 1979, Ser. No. 35,863

Int. Cl.³ G21F *5/04*

U.S. Cl. 378—150 **4 Claims**



1. An apparatus for proving in-motion slit radiography of objects of varying sizes and shapes, comprising:

an X-ray source;

an X-ray shielding structure positioned between said X-ray source and an object to be X-rayed;

said shielding structure including a platform forming a barrier to X-ray radiation and having an opening extending through said platform for passing therethrough radiation from said X-ray source to the object;

said opening having a triangular shaped portion, and a rectangular portion having one side coincident with the base of said triangular portion;

X-ray film positioned so that the object to be X-rayed is between said X-ray source and said film;

means for adjusting said opening in said structure to expose a portion of a surface of the object to substantially parallel beams of radiation at any one moment;

said means for adjusting said opening including a first pivotally mounted X-ray radiation shield attached to said platform for movement to a first position over said opening to adjust the size of a triangular slit formed thereby; and

means for moving the object relative to said X-ray source to cumulatively expose the entire surface of the object and said film to radiation from said X-ray source.

4,400,826

CRANIOSTATIC POSITIONER, PARTICULARLY FOR THE AMBULATORIAL RADIOGRAPHY OF THE TEMPORAL-MANDIBULAR ARTICULATION

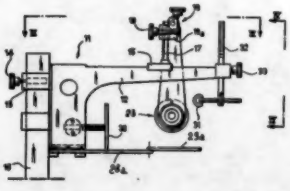
Giulio Preti, Strada Costalunga, 10/2 Moncalieri, and Franco Mongini, Strada del Nobile, 91 Torino, both of Italy

Filed Oct. 14, 1980, Ser. No. 196,946

Claims priority, application Italy, Oct. 17, 1979, 69014 A/79

Int. Cl.³ G03B *41/16*

U.S. Cl. 378—178 **7 Claims**



1. A craniostat, particularly for the ambulatorial radiogra-

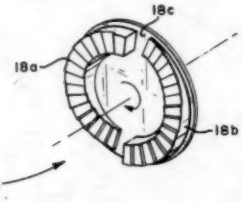
phy of the temporal-mandibular articulation, characterized in that it comprises a cantilevered stand or support carried for controlled height adjustment at the end of a columnar upright rigid with a seat, a supporting pivot pin carried by a slider arranged to be slidable on the horizontal arm of said cantilevered stand and subjected to controlled displacement parallel to said arm, a transverse yoke carried by said pivot pin for angular oscillation in the vertical plane containing said yoke, a pair of plates carried at the ends of said yoke and enabled to controllably move parallel to the axis of said yoke and rotate about said axis, one of said plates carrying at the free end thereof a collimator with a socket for the insertion of the X-ray tube therein, the other of said plates carrying at the free end thereof a cassette holder provided with a luminous centering device set coaxially to said collimator, and a means for positioning the patient's head relatively to the craniostat including a headrest and a forehead slider, both said headrest and said forehead slider being adjustable, as well as an auricolar compass provided with at least one swivelling extension adapted for cooperating with the patient's auricolar cavities in defining a reference plane containing anatomically definite and selectable points of the patient's cranial structure.

4,400,827

METHOD AND APPARATUS FOR CALIBRATING RAPID SEQUENCE RADIOGRAPHY

James R. Spears, 118 Riverway Pkwy., #2, Boston, Mass. 02215

Filed Nov. 13, 1981, Ser. No. 321,066
Int. Cl.³ G03B *41/16*; G21K *3/00*
U.S. Cl. 378—207 **10 Claims**



1. A method for calibrating rapid sequence radiography comprised of the steps of

positioning a movable wedge of radio-dense material in the field of interest between an x-ray source and cinematic photography means,

moving said wedge in synchronism with said cinematic photography means to place successive portions of said wedge over a constant position in said field to change the thickness of radio-dense material of said wedge over said position for each frame of said cinematic radiography,

recording on cinematic film each successive frame of said radiography,

developing said film,

projecting each successive frame of said developed film,

detecting the intensity of light at a constant position of each projected frame corresponding to said constant position of said wedge in said field,

from the intensity data developing a calibration curve relating light intensity to thickness of said wedge in said field of interest, and

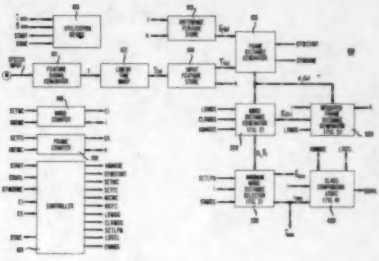
from said calibration curve translating intensity data at any position within said field into equivalent thickness of said wedge.

4,400,828

WORD RECOGNIZER

Frank C. Pirz, Madison; Lawrence R. Rabiner, Berkeley Heights, and Jay G. Wilpon, Warren, all of N.J., assignors to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed Mar. 27, 1981, Ser. No. 248,547
Int. Cl.³ G10L *1/00*; G06K *9/62*
U.S. Cl. 382—30 **16 Claims**



1. Apparatus for recognizing an input word as one of a set of reference words comprising

means for storing a plurality of reference word feature templates representative of said reference words;

means responsive to said input word for generating an input word feature template;

means responsive to said reference word feature templates and said input word feature template for identifying said input word as one of said reference words, characterized in that

said input word identifying means (**100**) comprises

means (**105,200**) responsive to said reference word feature templates and said input word feature template for generating a set of word distance signals;

said reference word feature templates and said input word feature template each have a plurality of frames;

said means for generating a set of word distance signals comprises means responsive to said reference word feature templates and said input word feature template for generating a set of frame distance signals representative of the similarity between frames of said reference word feature templates and said input word feature template, and means for combining said frame distance signals to produce said word distance signals;

means (**105, 200, 500**) responsive to said reference word feature templates and said input word feature template for generating a set of weighted word distance signals; and

means (**300, 400**) responsive to said word distance signals and said weighted word distance signals for selecting the reference word which most corresponds to said input word.

DESIGN PATENTS

GRANTED AUG. 23, 1983

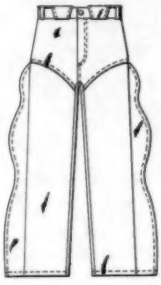
ERRATA

For CLASS	See PATENT NO.
D17–020	270,270
D18–027	270,271
D18–027	270,272
D19–052	270,273

DESIGNS

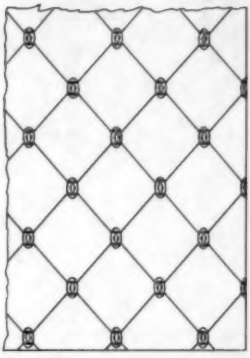
AUGUST 23, 1983

270,204
WESTERN PANTS
Jewel E. Akens, 5228 Marburn, Los Angeles, Calif. 90043
Filed Sep. 24, 1981, Ser. No. 305,178
Term of patent 14 years
Int. Cl. D2—*02*
U.S. Cl. D2—28

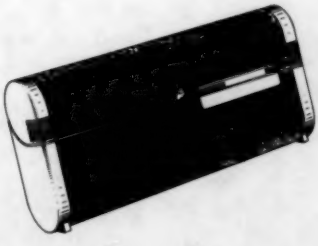


270,205
SNOW BOOT
Gino Casetta, Pontelongo-Padua, Italy, assignor to Simod Patents N.A. N.V., Curacao, Netherlands Antilles
Filed Nov. 12, 1980, Ser. No. 206,164
Claims priority, application Italy, May 16, 1980, 61939/80[U]
Term of patent 14 years
Int. Cl. D2—*04*
U.S. Cl. D2—272

270,206
SCARF
Joseph Kanoui, Geneva, Switzerland, assignor to Interdica S.A., Villars-sur-Glane, Switzerland
Filed Dec. 11, 1980, Ser. No. 215,447
Claims priority, application Hague, Jun. 16, 1980, 70404
Term of patent 14 years
Int. Cl. D02—*05*
U.S. Cl. D2—395

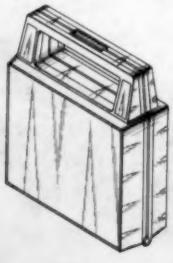


270,207
SPECTACLE CASE OR SIMILAR ARTICLE
Aaron M. Markovitz, Rochester, N.Y., assignor to Bausch & Lomb Incorporated, Rochester, N.Y.
Filed Nov. 9, 1981, Ser. No. 319,337
Term of patent 14 years
Int. Cl. D3—*02*
U.S. Cl. D3—34



270,208
LUGGAGE
Ted Stark, Montclair, N.J., assignor to M & M Luggage Co., Inc., Jersey City, N.J.
Filed Dec. 6, 1979, Ser. No. 100,813
Term of patent 14 years
Int. Cl. D3—*01*
U.S. Cl. D3—71

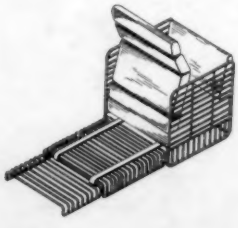
270,209
CARRYING CASE FOR A TOY
Geoffrey C. Garth, Long Beach, Calif., assignor to Tomy Corporation, Carson, Calif.
Filed Oct. 20, 1980, Ser. No. 198,802
Claims priority, application Japan, Aug. 27, 1979, 54-35692; Aug. 27, 1979, 54-35693
Term of patent 14 years
Int. Cl. D3—*02*
U.S. Cl. D3—73



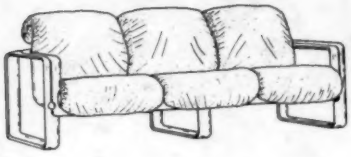
270,210
ADJUSTABLE CHAIR FOR A CHILD
Dirk Kortleve, Broeder Christofoorlaan 5, 4731 DW Oudenbosch, Netherlands
Filed Feb. 27, 1981, Ser. No. 239,127
Claims priority, application Fed. Rep. of Germany, Oct. 3, 1980, 1026/80
Term of patent 14 years
Int. Cl. D6—*01*
U.S. Cl. D6—7

270,211
INFANT SEAT
Clarence A. Oberly, 290 S. Ridge Rd., Lake Forest, Ill. 60045
Filed Jun. 15, 1981, Ser. No. 273,652
Term of patent 14 years
Int. Cl. D6—*01*
U.S. Cl. D6—7

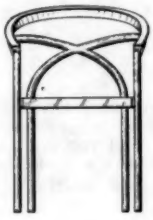
270,212
LAWN CHAIR
Edward Secon, Trumbull, Conn., assignor to The Sherwood Corporation, Spring City, Tenn.
Filed May 26, 1981, Ser. No. 266,940
Term of patent 14 years
Int. Cl. D6—*01*
U.S. Cl. D6—37



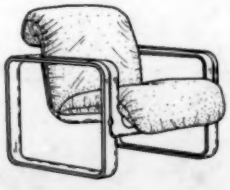
270,213
COUCH OR SIMILAR ARTICLE
Koni Ochsner, Wettingen, Switzerland, assignor to Giroflex-Entwicklungs AG, Koblenz, Switzerland
Filed Mar. 5, 1980, Ser. No. 127,455
Claims priority, application Switzerland, Sep. 10, 1979, DMA/000007
Term of patent 14 years
Int. Cl. D6—*01*
U.S. Cl. D6—63



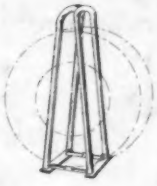
270,214
CHAIR
Michael F. Kirkpatrick, Old Farm Rd., Lincoln, Mass. 01773
Filed Jun. 16, 1981, Ser. No. 274,148
Term of patent 14 years
Int. Cl. D6—*01*
U.S. Cl. D6—70



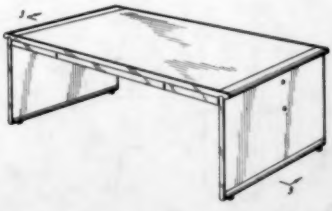
270,215
CHAIR OR SIMILAR ARTICLE
Koni Ochsner, Wettingen, Switzerland, assignor to Giroflex-Entwicklungs AG, Koblenz, Switzerland
Filed Mar. 5, 1980, Ser. No. 127,458
Claims priority, application Hague, Sep. 10, 1979, DMA/000007
The portion of the term of this patent subsequent to Aug. 23, 1997, has been disclaimed.
Term of patent 14 years
Int. Cl. D6—*01*
U.S. Cl. D6—73



270,216
PORTABLE STAND FOR SAFELY INFLATING TIRE AND WHEEL ASSEMBLIES
John D. Kusner, Mayfield Heights, Ohio, assignor to Warren Tool Corporation, Warren, Ohio
Filed Apr. 6, 1981, Ser. No. 251,480
Term of patent 14 years
Int. Cl. D6—*06*
U.S. Cl. D6—85

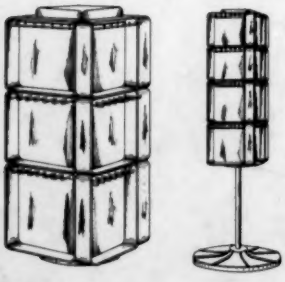


270,217
DESK
Roger Daventry, Unit 13, 531 Hay St., Subiaco, 6008, Western Australia, Australia
Filed Nov. 9, 1980, Ser. No. 207,061
Claims priority, application Australia, May 9, 1980, 80925
Term of patent 14 years
Int. Cl. D6—*04*
U.S. Cl. D6—161

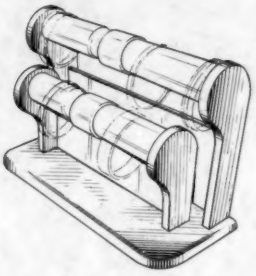


270,218
COMBINED HUTCH AND STORAGE CABINET
Stephen H. Robertson, and Randall L. Ward, both of P.O. Box 30153, Raleigh, N.C. 27622
Division of Ser. No. 60,899, Jul. 26, 1979. This application Jul. 28, 1981, Ser. No. 266,456
Term of patent 14 years
Int. Cl. D06—*04*
U.S. Cl. D6—168

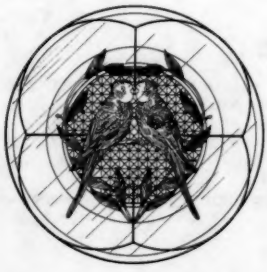
270,219
WATCHSTRAP DISPLAY STAND
Jacob J. Elias, Flushing, N.Y., assignor to Genal Strap, Inc., New York, N.Y.
Filed Feb. 17, 1981, Ser. No. 234,657
Term of patent 14 years
Int. Cl. D06—*04*
U.S. Cl. D6—186

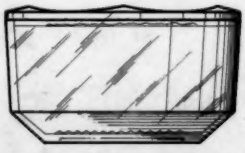


270,220
BRACELET DISPLAY STAND
Raymond J. Cuminale, New York, N.Y., assignor to Trifari, Krussman & Fishel, Inc., New York, N.Y.
Filed Jun. 8, 1981, Ser. No. 271,576
Term of patent 14 years
Int. Cl. D06—*04*
U.S. Cl. D6—186



270,221
COVERED CONTAINER
George C. Sun, 530 Rhode Island Ave., Cherry Hill, N.J. 08002
Filed Nov. 24, 1981, Ser. No. 324,562
Term of patent 14 years
Int. Cl. D7—*01*
U.S. Cl. D7—17



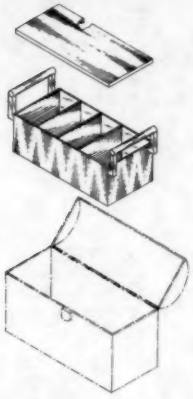


270,222

FOOD COMPARTMENT FOR A LUNCHBOX

Ollie L. Parmley, 1100 B Rivergrove Apartments, Scottsboro, Ala. 35768 (now by change of name from Ollie L. Wininger)

Filed Feb. 2, 1981, Ser. No. 230,648
Term of patent 14 years
Int. Cl. D03—*01*
U.S. Cl. D7—*76*

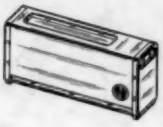


270,223

TOASTER

Takao Miyake; Masayoshi Kawaishi, and Kazuo Tsujimoto, all of Osaka, Japan, assignors to Sharp Corporation, Osaka, Japan

Filed Mar. 17, 1981, Ser. No. 244,594
Claims priority, application Japan, Sep. 18, 1980, 55-38714
Term of patent 14 years
Int. Cl. D07—*02*
U.S. Cl. D7—330

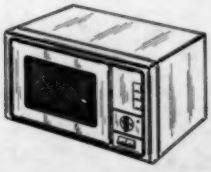


270,224

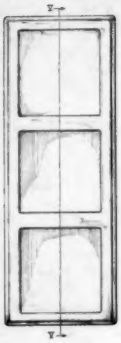
MICROWAVE OVEN

Yoshitsugu Hirose; Hiroshi Fujii, and Masakazu Sugiyama, all of Osaka, Japan, assignors to Sharp Corporation, Osaka, Japan

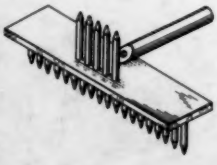
Filed Jun. 15, 1981, Ser. No. 273,449
Claims priority, application Japan, Dec. 19, 1980, 55-53643
Term of patent 14 years
Int. Cl. D7—*02*
U.S. Cl. D7—351



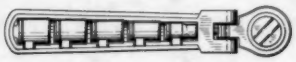
270,225
COMPARTMENTED PAN
Robert D. Chiulli, 71 Cherry St., Somerville, Mass. 02144
Filed Jun. 22, 1981, Ser. No. 275,750
Term of patent 14 years
Int. Cl. D07—*02*
U.S. Cl. D7—357



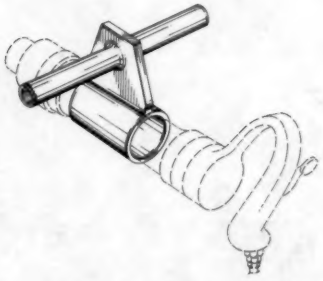
270,226
HEAD FOR A WEED COMB
Robert A. Scarsciotti, 7 Steven La., Medfield, Mass. 02052
Filed Jun. 15, 1981, Ser. No. 273,437
Term of patent 14 years
Int. Cl. D8—*01*
U.S. Cl. D8—13



270,227
RATCHET TOOL
Allen K. Roth, Whitewater; Glen W. Ediger, and Harold F. Bauer, both of Newton, all of Kans., assignors to S/V Tool Company, Newton, Kans.
Filed Jan. 12, 1981, Ser. No. 224,170
Term of patent 14 years
Int. Cl. D8—*05*
U.S. Cl. D8—25

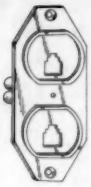


270,228
HANDLE ATTACHMENT FOR A PNEUMATIC TOOL OR THE LIKE
Charles W. Mayo, Rte. 3, Box #30, Longview, Tex. 75603
Filed Sep. 2, 1980, Ser. No. 183,770
Term of patent 14 years
Int. Cl. D8—*05*
U.S. Cl. D8—70

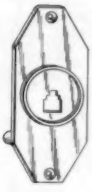


270,229
TOOL AND OPERATOR HEAD FOR TOOL-OPERATED LOCK
Gordon G. Zeidman, Columbus, Ohio, assignor to The Eastern Company, Cleveland, Ohio
Filed Oct. 22, 1980, Ser. No. 199,548
Term of patent 14 years
Int. Cl. D8—*07*
U.S. Cl. D8—331

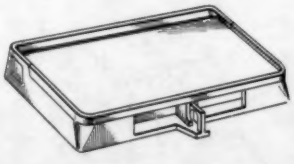
270,230
TELEPHONE OUTLET RECEPTACLE PLATE
Daniel Meyer, Rochester, Minn., assignor to Communications Systems, Inc., Hector, Minn.
Filed Nov. 28, 1980, Ser. No. 211,086
Term of patent 14 years
Int. Cl. D8—*08;* D13—*03*
U.S. Cl. D8—350



270,231
TELEPHONE OUTLET RECEPTACLE PLATE
Daniel Meyer, Rochester, Minn., assignor to Communications Systems, Inc., Hector, Minn.
Filed Nov. 28, 1980, Ser. No. 211,268
Term of patent 14 years
Int. Cl. D8—*08;* D13—*03*
U.S. Cl. D8—350

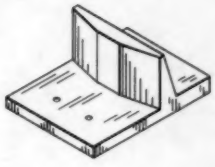


270,232
WEATHERPROOF COVER ASSEMBLY
Henry Leong, Kendall Park, N.J., assignor to GTE Products Corporation, Stamford, Conn.
Filed Mar. 9, 1981, Ser. No. 241,798
Term of patent 14 years
Int. Cl. D8—*09;* D13—*03*
U.S. Cl. D8—353



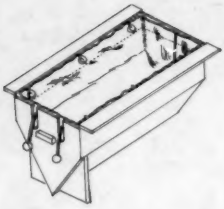
270,233
FASTENER FOR FLEXIBLE LINE WITH THREADED BOLT
James J. Hawk, 12906 Peoria, Houston, Tex. 77015
Filed Oct. 27, 1980, Ser. No. 200,641
Term of patent 14 years
Int. Cl. D8—*08*
U.S. Cl. D8—356

270,234
DOOR STOP
Joseph A. Shuster, North Huntingdon, Pa., assignor to Shuster's Builders Supplies, Inc., North Huntingdon, Pa.
Filed Feb. 9, 1981, Ser. No. 232,903
Term of patent 14 years
Int. Cl. D8—*99*
U.S. Cl. D8—402

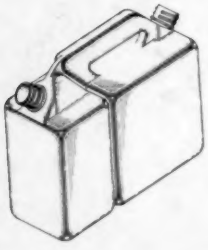


270,235
COMBINED BOTTLE AND DISPENSER
Edwin E. Ewry, Mill Valley, Calif., assignor to United States Borax & Chemical Corporation, Los Angeles, Calif.
Filed Apr. 2, 1981, Ser. No. 250,337
Term of patent 14 years
Int. Cl. D9—*01*
U.S. Cl. D9—300

270,236
DISPOSABLE PLASTIC BAG AND CONTAINER THEREFOR
Neville Stoute, New York, N.Y., and Robert J. Pennise, Colmar, Pa., assignors to Neville Stoute; Robert J. Pennise; Richard M. Bird and James A. Falborn, all of New York, N.Y.
Filed Feb. 29, 1980, Ser. No. 126,145
Term of patent 14 years
Int. Cl. D9—*05*
U.S. Cl. D9—309

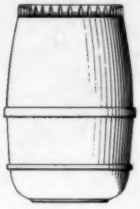


270,237
DUAL COMPARTMENT CONTAINER
Borge T. Hestehave, Ontario, Calif., assignor to Bomatic, Inc., Ontario, Calif.
Filed Apr. 8, 1981, Ser. No. 251,999
Term of patent 14 years
Int. Cl. D9—*01*
U.S. Cl. D9—341



270,238
DISPENSING CONTAINER FOR FLUID MATERIAL
Jüri Vilval, Sturegatan 28, 114 36 Stockholm, Sweden
Filed May 21, 1981, Ser. No. 265,816
Claims priority, application Sweden, Jan. 21, 1981, 810113
Term of patent 14 years
Int. Cl. D9—*01*
U.S. Cl. D9—353

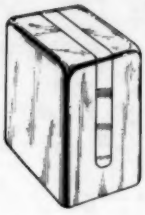
270,239
PACKAGING CONTAINER
Vincent E. Fortuna, Garden Grove, Calif., assignor to Cosden Technology, Inc., Dallas, Tex.
Filed Apr. 13, 1981, Ser. No. 253,811
Term of patent 14 years
Int. Cl. D9—*01*
U.S. Cl. D9—398



270,240
BOTTLE
Edwin E. Ewry, Mill Valley, Calif., assignor to U.S. Borax & Chemical Corporation, Los Angeles, Calif.
Filed Apr. 2, 1981, Ser. No. 250,336
Term of patent 14 years
Int. Cl. D9—*01*
U.S. Cl. D9—401

270,241
CONTAINER CLOSURE
Pierre Ballereaud, Dammarie, France, assignor to Produits de Beaute Lancaster, Monte Carlo, Monaco
Filed Feb. 18, 1981, Ser. No. 235,726
Claims priority, application France, Aug. 20, 1980, 802679
Term of patent 14 years
Int. Cl. D9—*07*
U.S. Cl. D9—435

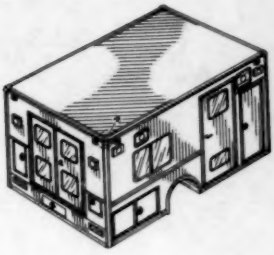
270,242
CONTAINER CLOSURE
Pierre Ballereaud, Dammarie, France, assignor to Produits de Beaute Lancaster, Monte Carlo, Monaco
Filed Feb. 18, 1981, Ser. No. 235,728
Claims priority, application France, Aug. 20, 1980, 802679
Term of patent 14 years
Int. Cl. D9—*07*
U.S. Cl. D9—435



270,243
CHRONOGRAPH
Ferdinand A. Porsche, St. Georgen, Winkl 5, 5662 Gries/Pinzgau, Austria
Filed Apr. 6, 1981, Ser. No. 251,230
Term of patent 14 years
Int. Cl. D10—*02*
U.S. Cl. D10—30

270,244
DIGITAL WATCH CASE
James F. McCormick, Tempe, Ariz. assignor to Amba Marketing Systems, Inc., Tempe, Ariz.
Filed Jun. 8, 1981, Ser. No. 271,542
Term of patent 14 years
Int. Cl. D10—*02*
U.S. Cl. D10—30

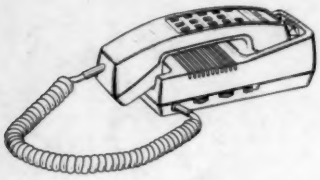
270,245
AMBULANCE BODY OR SIMILAR ARTICLE
Robert R. Collins, 646 Bonita Dr., Winter Park, Fla. 32789, and Carl H. Rimmler, 102 E. Plantation Blvd., Lake Mary, Fla. 32746
Filed Dec. 31, 1980, Ser. No. 221,804
Term of patent 14 years
Int. Cl. D12—*08*
U.S. Cl. D12—96

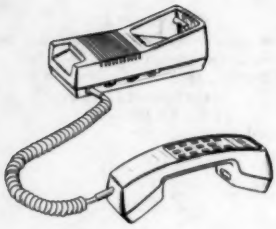


270,246
SHAPED PLUG
Lothar W. Freimuth, Ringwood, N.J., assignor to Universal Manufacturing Corporation, Paterson, N.J.
Filed Feb. 13, 1981, Ser. No. 234,320
Term of patent 14 years
Int. Cl. D13—*03*
U.S. Cl. D13—30

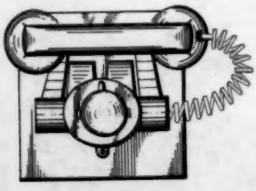
270,247
COMMUNICATION RECEPTACLE BLOCK HAVING SNAP MOUNTING LUGS
Curtis A. Sampson; Ronald W. Wiseheart, both of Hector, and Daniel Meyer, Rochester, all of Minn., assignors to Communications Systems, Inc., Hector, Minn.
Filed Jun. 15, 1981, Ser. No. 273,657
Term of patent 14 years
Int. Cl. D13—*03*
U.S. Cl. D13—30

270,248
TELEPHONE SET
Hisao Fukushima, and Junji Hirooka, both of Tokyo, Japan, assignors to Oki Electric Industry Co., Ltd., Tokyo, Japan
Filed Oct. 21, 1980, Ser. No. 199,243
Claims priority, application Japan, Apr. 25, 1980, 55-016170
Term of patent 14 years
Int. Cl. D14—*03*
U.S. Cl. D14—53

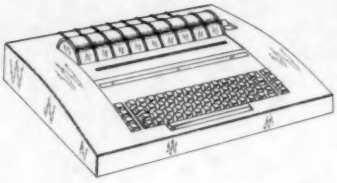




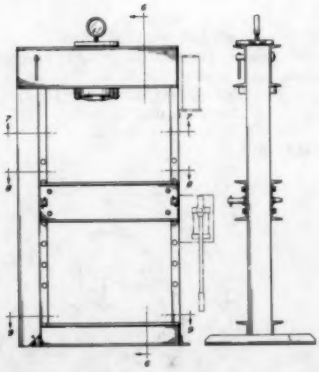
270,249
TELEPHONE
Wesley L. Thomas, 109 S. Catalina St., Los Angeles, Calif. 90004
Filed Jan. 26, 1981, Ser. No. 228,116
Term of patent 14 years
Int. Cl. D14—*03;* D21—*01*
U.S. Cl. D14—53



270,250
DATA TERMINAL PRINTER
Robert P. Tennant, Binghamton, and Timothy D. Wetzel, Endicott, both of N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.
Filed Jul. 10, 1980, Ser. No. 167,306
Term of patent 14 years
Int. Cl. D14—*02;* D18—*02*
U.S. Cl. D14—111



270,251
PRESS
Phillip A. Spainhour, Waukegan; Leo C. Bogaerts, Antioch; Robert S. Hampton, Jr., Wadsworth, and Leonard A. Morrison, Chicago, all of Ill., assignors to Ammco Tools, North Chicago, Ill.
Filed Jun. 12, 1981, Ser. No. 273,232
Term of patent 14 years
Int. Cl. D15—*99*
U.S. Cl. D15—123



270,252

ELECTROSTATIC COPYING MACHINE

Shigeaki Hayashi, Osaka, Japan, assignor to Sharp Corporation, Osaka, Japan

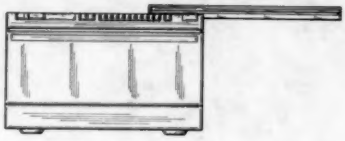
Filed May 18, 1981, Ser. No. 264,795

Claims priority, application Japan, Nov. 28, 1980, 55-50161

Term of patent 14 years

Int. Cl. D16—*03*

U.S. Cl. D16—31



270,253

COMBINED COPYING AND SORTING MACHINE

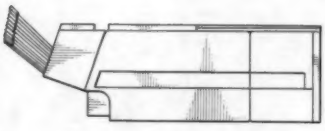
R. Clark DuBois, Fairfield, and John C. Hamma, Milford, both of Conn., assignors to Gradco/Dendoki, Inc., Santa Ana, Calif.

Filed Jul. 2, 1981, Ser. No. 279,835

Term of patent 14 years

Int. Cl. D16—*03*

U.S. Cl. D16—31



270,254

GUITAR

Bruce N. Hardy, Elkhart, Ind., assignor to Silver Street, Inc., Elkhart, Ind.

Filed Aug. 3, 1981, Ser. No. 289,292

Term of patent 14 years

Int. Cl. D17—*03*

U.S. Cl. D17—14

270,255

ELECTRIC VIOLIN

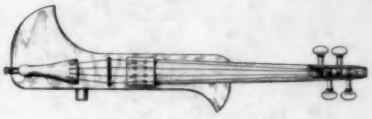
Richard B. Saidat, St. Charles, Ill., assignor to Fischer Industries, Inc., Geneva, Ill.

Filed Mar. 27, 1981, Ser. No. 248,289

Term of patent 14 years

Int. Cl. D17—*03*

U.S. Cl. D17—17



270,256

DESK ORGANIZER

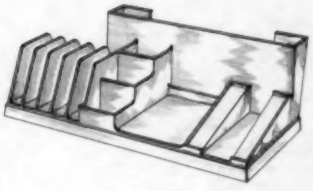
Richard W. Sankey, North Canton, Ohio, assignor to Alpha Enterprises, Inc., Canton, Ohio

Filed Jul. 10, 1981, Ser. No. 281,982

Term of patent 14 years

Int. Cl. D19—*02*

U.S. Cl. D19—77



270,257

ILLUMINATED SIGN WITH CHANNELS FOR MOVEABLE CHARACTER PLATES

Ralph Kutschmende, 395 Manhattan Ave., Brooklyn, N.Y. 11211

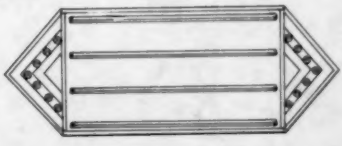
Filed Jun. 18, 1981, Ser. No. 275,137

The portion of the term of this patent subsequent to Jan. 26, 1996, has been disclaimed.

Term of patent 14 years

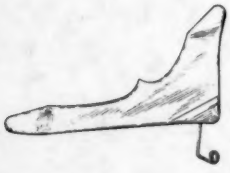
Int. Cl. D20—*03*

U.S. Cl. D20—10

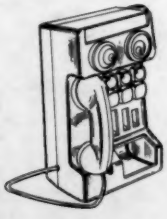


270,258
GAME PLAYING BOARD
Hirokatsu Iwaya, and Hiroshi Kaneko, both of Tokyo, Japan, assignors to Yonezawa Toys Co., Ltd. and Iwaya Co., Ltd., both of Tokyo, Japan
Filed Oct. 9, 1980, Ser. No. 195,642
Claims priority, application Japan, Jul. 15, 1980, 55-28426
Term of patent 14 years
Int. Cl. D21—*01*
U.S. Cl. D21—31

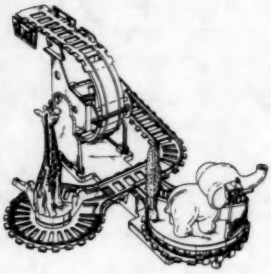
270,259
TOY SAILPLANE
Carl Z. Hermann, Sugar Hill Rd., Falls Village, Conn. 06031, and Timothy L. Locke, Lower River Rd., West Cornwall, Conn. 06796
Filed Sep. 22, 1980, Ser. No. 189,688
Term of patent 14 years
Int. Cl. D21—*01*
U.S. Cl. D21—89



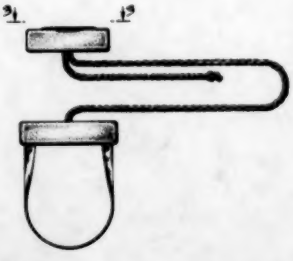
270,260
TOY TELEPHONE
Mel Appel, Nine Nottingham Rd., Livingston, N.J. 07039, and George Kress, Scotch Plains, N.J. 07076, assignors to Mel Appel, Livingston, N.J.
Filed Apr. 13, 1981, Ser. No. 253,239
Term of patent 14 years
Int. Cl. D21—*01*
U.S. Cl. D21—111



270,261
TOY TRACKWAY
Man-Kwai Lee, Kowloon, Hong Kong, assignor to New Bright Industrial Company, Ltd., Kowloon, Hong Kong
Filed Jul. 3, 1980, Ser. No. 165,662
Claims priority, application United Kingdom, Jan. 16, 1980, 80993185
Term of patent 14 years
Int. Cl. D21—*01*
U.S. Cl. D21—143

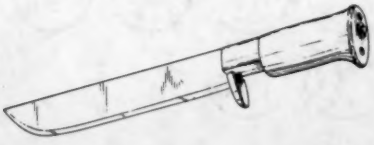


270,262
EXERCISE DEVICE
Cody C. Rembe, 11305 N. Sundown Dr., Scottsdale, Ariz. 85260
Filed Jan. 19, 1981, Ser. No. 225,963
Term of patent 14 years
Int. Cl. D21—*02*
U.S. Cl. D21—198

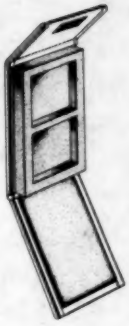


270,263
PHYSICAL EXERCISER
Gert F. Kölbel, Hanover, Fed. Rep. of Germany, assignor to Compret N.V., Amsterdam, Netherlands
Filed Feb. 17, 1981, Ser. No. 235,358
Claims priority, application United Kingdom, Aug. 14, 1980, 996140
Term of patent 14 years
Int. Cl. D21—*01*
U.S. Cl. D21—198

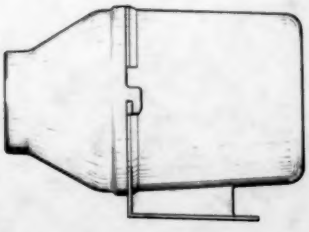
270,264
KNIFE WITH GUARD MEANS
Arild Y. Mathisen, Postboks 65, N-9845 Tana, Norway
Filed Jun. 17, 1981, Ser. No. 274,694
Claims priority, application Norway, Jan. 9, 1981, 61656
Term of patent 14 years
Int. Cl. D22—*05*
U.S. Cl. D22—1



270,265
COMBINED FLY AND FISHING LURE HOLDER
William B. Kircher, Johnson County, Kans., and Thomas C. Huntebrinker, Jackson County, Mo., assignors to North Fork Industries, Inc., Kansas City, Mo.
Filed Mar. 6, 1981, Ser. No. 241,045
Term of patent 14 years
Int. Cl. D22—*05*
U.S. Cl. D22—13



270,266
MINNOW TRAP
Frank E. Morrison, 144 Stants Pl., Bartlesville, Okla. 74003
Filed May 11, 1981, Ser. No. 262,418
Term of patent 14 years
Int. Cl. D22—*06*
U.S. Cl. D22—18

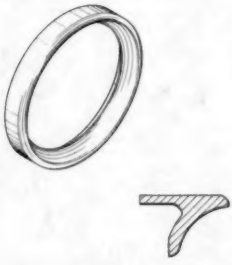


270,267
INSECT LURE
Daniel M. Stout, Kirkwood, Mo., assignor to Whitmire Research Laboratories, Inc., St. Louis, Mo.
Filed Jun. 17, 1981, Ser. No. 274,550
Term of patent 14 years
Int. Cl. D22—*06*
U.S. Cl. D22—19

270,268
LINE GUIDE FOR FISHING ROD
Ryuichi Ohmura, Shizuoka, Japan, assignor to Fuji Kogyo Co., Ltd., Shizuoka, Japan
Filed Jun. 3, 1981, Ser. No. 270,551
Term of patent 14 years
Int. Cl. D22—*05*
U.S. Cl. D22—24

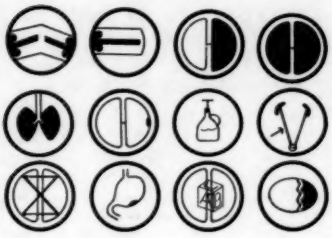
270,269
FISHING LURE
Theodore B. Miller, 1316 Dorcas St., San Diego, Calif. 92110
Filed Jun. 15, 1981, Ser. No. 273,989
Term of patent 14 years
Int. Cl. D22—*05*
U.S. Cl. D22—27

270,270
TONE RING FOR A BANJO
Gary H. Price, 1117 Denmark, Grand Prairie, Tex. 75050
Filed Mar. 20, 1981, Ser. No. 245,756
Term of patent 14 years
Int. Cl. D17—*03*
U.S. Cl. D17—20



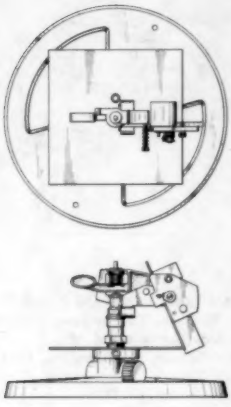
270,271
MEDICAL FONT
Amelia T. Steele, 955 Goffsfalls Rd., Manchester, N.H. 03103
Filed Apr. 1, 1980, Ser. No. 136,281
Term of patent 14 years
Int. Cl. D18—*03*
U.S. Cl. D18—27

270,272
MEDICAL FONT
Amelia T. Steele, 467 Seames Dr., Manchester, N.H. 03101
Filed May 14, 1980, Ser. No. 145,964
Term of patent 14 years
Int. Cl. D18—*03*
U.S. Cl. D18—27



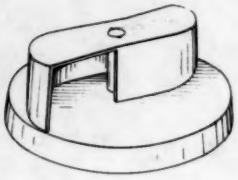
270,273
ERASABLE MEMORANDUM BOARD WITH ADVERTISING SPACE
Gordon W. Kosmicki, Grand Island, Nebr., assignor to Jerry Godkin, Grand Island, Nebr.
Filed May 7, 1981, Ser. No. 261,580
Term of patent 14 years
Int. Cl. D19—*07*
U.S. Cl. D19—52

270,274
ROTARY SPRINKLER
David M. Rau, III, and Neil W. Sullivan, both of Lincoln, Nebr., assignors to Capabilities Unlimited, Inc., Lincoln, Nebr.
Filed Nov. 3, 1980, Ser. No. 203,267
Term of patent 14 years
Int. Cl. D23—*01*
U.S. Cl. D23—7

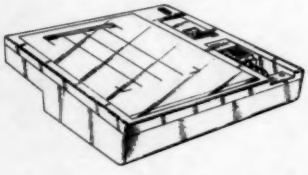


270,275
AIR PRE-COOLER UNIT FOR AIR CONDITIONERS OR THE LIKE
William E. Morrow, and Robert B. Morrow, both of Winston-Salem, N.C., assignors to Aqua-Mist, Inc., Winston-Salem, N.C.
Filed Apr. 14, 1981, Ser. No. 254,196
Term of patent 14 years
Int. Cl. D23—*04*
U.S. Cl. D23—139

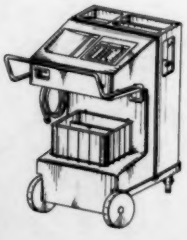
270,276
VENTILATOR
Derek V. Stern, and Noel W. Fleury, both of London, England, assignors to Flettner Ventilator Limited, London, England
Filed Jan. 23, 1981, Ser. No. 227,985
Claims priority, application United Kingdom, Jul. 25, 1980, 80995883
Term of patent 14 years
Int. Cl. D23—*04*
U.S. Cl. D23—153



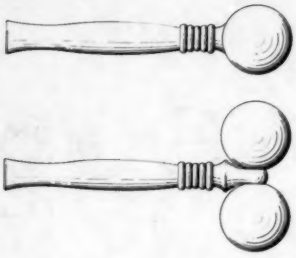
270,277
AUTORADIOGRAM READER
John E. Studer, Madison, N.J., assignor to Bethesda Research Laboratories, Inc., Gaithersburg, Md.
Filed Jun. 28, 1982, Ser. No. 393,134
Term of patent 14 years
Int. Cl. D24—*01*
U.S. Cl. D24—1.1



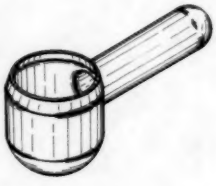
270,278
ELECTROCARDIOGRAPH
Walter W. Wiebe, Brewster, N.Y., assignor to International Business Machines Corporation, Armonk, N.Y.
Filed Jun. 1, 1981, Ser. No. 268,877
Term of patent 14 years
Int. Cl. D24—*01, 02*
U.S. Cl. D24—17



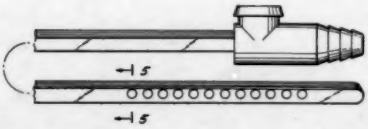
270,279
HAND HELD ROLLER MASSAGER
Kirby A. Hamilton, 155 Clyde St., Chestnut Hill, Mass. 02167
Filed Jul. 27, 1981, Ser. No. 286,838
Term of patent 14 years
Int. Cl. D28—*03*
U.S. Cl. D24—36



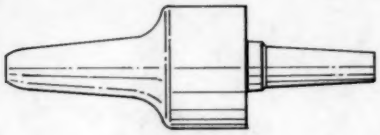
270,280
VIBRATOR ATTACHMENT OR THE LIKE
Richard E. Epstein, 709 Olive Ct., Galt, Calif. 95632
Filed Aug. 18, 1980, Ser. No. 178,966
Term of patent 14 years
Int. Cl. D28—*03*
U.S. Cl. D24—41



270,281
MEDICAL TUBING
Harold W. Andersen; Charles H. Harrison, both of Oyster Bay, and Melvin H. Worth, Jr., Staten Island, all of N.Y., assignors to University Testing Service Inc., Oyster Bay, N.Y.
Filed Dec. 12, 1980, Ser. No. 215,899
Term of patent 14 years
Int. Cl. D24—*02*
U.S. Cl. D24—53



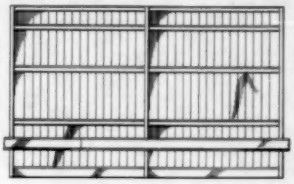
270,282
CATHETER INSERTION ADAPTER
James R. Gross, Bartlett, Ill., assignor to Abbott Laboratories, North Chicago, Ill.
Filed Oct. 9, 1980, Ser. No. 195,450
Term of patent 14 years
Int. Cl. D24—*02*
U.S. Cl. D24—54



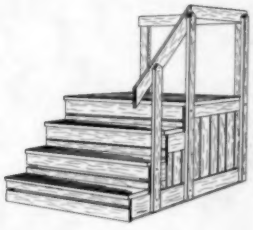
270,283
NASAL NOZZLE
Robert A. Goodnow; Floyd J. Shade; Thomas A. Sloboth, and Donald J. Kaye, all of Omaha, Nebr., assignors to Schering Corporation, Kenilworth, N.J.
Filed Jan. 28, 1980, Ser. No. 116,160
Term of patent 14 years
Int. Cl. D24—*99*
U.S. Cl. D24—62

270,284
FOOT JOINT SUPPORT
Kjell E. Lindh, Kardvägen 13, S-752 57 Uppsala, and Kjell H. Sundin, Björkhaga 5, S-752 56 Uppsala, both of Sweden
Filed May 5, 1981, Ser. No. 260,678
Claims priority, application Sweden, Nov. 12, 1980, 80-2245
Term of patent 14 years
Int. Cl. D24—*04*
U.S. Cl. D24—64

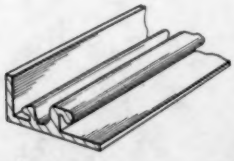
270,285
TIMBER FENCING WITH GUARDRAIL
Vincent M. Demarest, Ipsden, Wallingford, Oxford 0X9 6BS, England
Filed Feb. 11, 1981, Ser. No. 233,510
Term of patent 14 years
Int. Cl. D25—*02*
U.S. Cl. D25—38



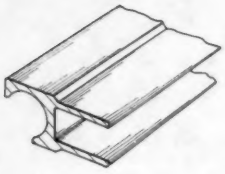
270,286
INTERCHANGEABLE ENTRANCE STAIRCASE FOR MOBILE HOMES AND THE LIKE
Francis L. Struben, and Jean C. Struben, both of 3870 Jarrettsville Pike, Jarrettsville, Md. 21084
Filed Aug. 20, 1981, Ser. No. 283,208
Term of patent 14 years
Int. Cl. D25—*02*
U.S. Cl. D25—63



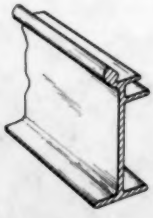
270,287
INTERLOCKING COMPONENT FOR INTERCONNECTING THE SIDE PANELS OF A COLLAPSIBLE CONTAINER
Vincent J. Smith, West Somerset, Australia, assignor to TAS Engineering Service Pty. Ltd., West Somerset, Australia
Filed Mar. 10, 1981, Ser. No. 242,269
Claims priority, application Australia, Sep. 11, 1980, 82010
Term of patent 14 years
Int. Cl. D25—*01*
U.S. Cl. D25—74



270,288
EDGE COMPONENT FOR THE SIDE PANELS OF A COLLAPSIBLE CONTAINER
Vincent J. Smith, West Somerset, Australia, assignor to TAS Engineering Service Pty. Ltd., West Somerset, Australia
Filed Mar. 10, 1981, Ser. No. 242,270
Claims priority, application Australia, Sep. 11, 1980, 82011
Term of patent 14 years
Int. Cl. D25—*74*
U.S. Cl. D25—74



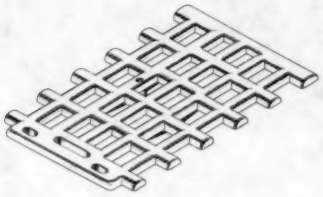
270,289
FRAME COMPONENT FOR THE BASE OF A COLLAPSIBLE CONTAINER
Vincent J. Smith, West Somerset, Australia, assignor to TAS Engineering Service Pty. Ltd., West Somerset, Australia
Filed Mar. 10, 1981, Ser. No. 242,271
Claims priority, application Australia, Sep. 11, 1980, 82012; Sep. 11, 1980, 82013; Sep. 11, 1980, 82014
Term of patent 14 years
Int. Cl. D25—*01*
U.S. Cl. D25—74



270,290
CERAMIC TILE PANEL
Francesco Roggero; Bruno Rossio, and Giuseppe Bossi, all of Milan, Italy, assignors to Nuove Industrie Ceramiche Cedit S.p.A., Milan, Italy
Filed Mar. 27, 1981, Ser. No. 248,457
Claims priority, application Italy, Oct. 2, 1980, 22986 B/80
Term of patent 14 years
Int. Cl. D25—*01*
U.S. Cl. D25—84

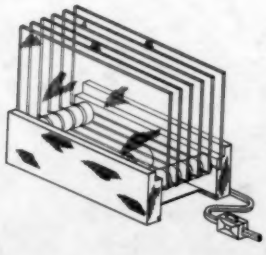
270,291
CERAMIC TILE PANEL
Francesco Roggero; Bruno Rossio, and Giuseppe Bossi, all of Milan, Italy, assignors to Nuove Industrie Ceramiche Cedit S.p.A., Milan, Italy
Filed Mar. 27, 1981, Ser. No. 248,459
Claims priority, application Italy, Feb. 10, 1981, 20728 B/81
Term of patent 14 years
Int. Cl. D25—*01*
U.S. Cl. D25—84

270,292
UPPER GRATE SECTION FOR SLIDING CAST IRON GRATE ASSEMBLY
William H. Johnson, Harrisonburg, Va., assignor to Shenandoah Manufacturing Co., Inc., Harrisonburg, Va.
Filed Sep. 28, 1981, Ser. No. 306,547
Term of patent 14 years
Int. Cl. D25—*01*
U.S. Cl. D25—91

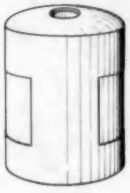


270,293
COMBINED FLUORESCENT LAMP AND FLASHING BEACON WITH AUTOMOBILE PLUG
Yuen Se-Kit, Kowloon, Hong Kong, assignor to Parly Tools Manufacturing Limited, Hong Kong
Filed Jan. 16, 1981, Ser. No. 225,670
Claims priority, application United Kingdom, Jul. 18, 1980, 995 784
Term of patent 14 years
Int. Cl. D26—*02*
U.S. Cl. D26—42

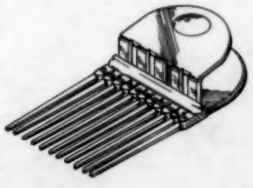
270,294
LAMP
Richard C. Wilson, Box 26, Champlin, Minn. 55316
Filed Jan. 12, 1981, Ser. No. 224,060
Term of patent 14 years
Int. Cl. D26—*05*
U.S. Cl. D26—93



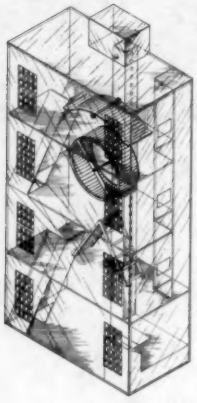
270,295
CIGAR AND CIGARETTE FILTER PERFORATOR
Rafael T. Cervantes, Malaga, Spain, assignor to The Westbury Foundation, Andorra and Sociedad de Dispositivos Reductores de Tabaco, S.A., Spain, a part interest
Filed Jun. 29, 1981, Ser. No. 278,381
Term of patent 14 years
Int. Cl. D27—*03*
U.S. Cl. D27—51



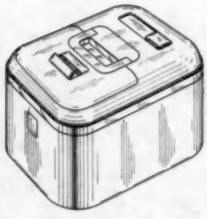
270,296
HAIR LIFTER
Rodney E. Thomas, 3708-D Candlewood Dr., East Point, Ga. 30344
Filed Sep. 15, 1981, Ser. No. 302,582
Term of patent 14 years
Int. Cl. D28—*03*
U.S. Cl. D28—31



270,297
SMALL ANIMAL HABITAT
Robert O. Lovitt, 1500 Warren La., Fort Worth, Tex. 76112
Filed Jun. 8, 1981, Ser. No. 271,406
Term of patent 14 years
Int. Cl. D30—*02*
U.S. Cl. D30—1



270,298
VACUUM CLEANER
Isao Ayukawa; Sachio Yamamoto, and Akira Tsukada, all of Osaka, Japan, assignors to Sharp Corporation, Osaka, Japan
Filed Jul. 27, 1981, Ser. No. 319,026
Claims priority, application Japan, Jan. 29, 1981, 56-3291
Term of patent 14 years
Int. Cl. D15—*05*
U.S. Cl. D32—21



LIST OF PATENTEES

TO WHOM

PATENTS WERE ISSUED ON THE 23RD DAY OF AUGUST, 1983

NOTE.—Arranged in accordance with the first significant character or word of the name (in accordance with city and telephone directory practice).

AB Asea Atom: *See*—
Fredin, Bo; and Nylund, Olov, 4,400,347, Cl. 376-333.000.

AB Volvo: *See*—
Holmer, Heinz E. A., 4,399,786, Cl. 123-301.000.

Abatjoglou, Anthony G.; and Billig, Ernst, to Union Carbide Corporation. Hydroformylation process using bisphosphine monooxide ligands. 4,400,548, Cl. 568-454.000.

Abbes, Claude; Rouaud, Christian; Forges, Robert; and de Villepoix, Raymond, to Commissariat a l'Engergie Atomique & Societ Brachier et Fils. Pipe coupling. 4,400,018, Cl. 285-31.000.

Abbott, Alfred H.: *See*—
Lance, William A.; and Abbott, Alfred H., 4,399,905, Cl. 198-422.000.

Abe, Hidetoshi: *See*—
Nagae, Yoshiharu; Ito, Tetsuo; Kitajima, Masaaki; Kawakami, Hideaki; Nakano, Fumio; Abe, Hidetoshi; Isogai, Masato; Ooue, Michio; and Mukoh, Akio, 4,400,059, Cl. 350-332.000.

Abendroth, Werner, to Carl Still GmbH & Co. KG, Firma. Coke oven door having outer and inner sealing blades. 4,400,240, Cl. 202-248.000.

Abernathy, Marshall W., Jr.; and Jurgens, Kenneth C., Jr., to Cosden Technology, Inc. Polymerization of isobutylene. 4,400,493, Cl. 526-68.000.

Acker, Jesse L.: *See*—
Meserol, Peter M.; and Acker, Jesse L., 4,400,353, Cl. 422-73.000.

Ackermann, Luc, to Pont A Mousson S.A. Process for the production of iron, phosphorus, carbon and chromium based amorphous metal alloys, and the alloys obtained. 4,400,208, Cl. 75-129.000.

Acrometal Products, Inc.: *See*—
Steinback, Clarence I., 4,399,637, Cl. 51-138.000.

Adachi, Yoshiharu: *See*—
Kuromitsu, Hiromu; and Adachi, Yoshiharu, 4,400,602, Cl. 200-82.00C.

Adam, John D.: *See*—
Daniel, Michael R.; Adam, John D.; and Moore, Robert A., 4,400,669, Cl. 333-141.000.

ADCO Aerospace, Inc.: *See*—
Hillman, Leon, 4,400,270, Cl. 210-103.000.

Adcock, James L.: *See*—
Lagow, Richard J.; Adcock, James L.; and Maraschin, Norma J., 4,400,532, Cl. 560-227.000.

Adelman, Michael R. Device for self-tailing a conventional winch drum. 4,399,979, Cl. 254-338.000.

Adkins, Joel E.; Stout, Gregg W.; and Johnston, Russell A., to Otis Engineering Corporation. Chemical injection valve with openable bypass. 4,399,871, Cl. 166-325.000.

Adrian, Gerhard: *See*—
Haacke, Wigo; Adrian, Gerhard; Gawol, Manfred; Henbach, Rainer; and 37, 4,400,365, Cl. 423-306.000.

Advani, Gulu N.; Beard, Robert; and Nanis, Leonard, to Sierra Monitor Corporation. Gas measurement method. 4,399,684, Cl. 73-1.00G.

Agency of Industrial Science & Technology: *See*—
Osumi, Yasuaki; Suzuki, Hiroshi; Kato, Akihiko; Oguro, Keisuke; and Nakane, Masanori, 4,400,348, Cl. 420-443.000.

Agrowplow Pty Limited: *See*—
Ryan, John W., 4,399,874, Cl. 172-269.000.

Ahumada, Jorge S., to Rogers Corporation. Membrane switch assembly. 4,400,595, Cl. 200-5.00A.

Aichinger, Horst; and Kranberg, Heinz E., to Siemens Aktiengesellschaft. Apparatus for the measurement of the X-ray tube high voltage. 4,400,821, Cl. 378-97.000.

Aida, Toshiyuki: *See*—
Taguchi, Sadanori; Honda, Yukio; Aida, Toshiyuki; and Kawabe, Ushio, 4,400,648, Cl. 313-346.00R.

Air Products and Chemicals, Inc.: *See*—
Bechara, Ibrahim S.; and Mascioli, Rocco L., 4,400,476, Cl. 521-107.000.
Patel, Suresh U.; Cormier, Thomas E.; and Wilson, Keith B., 4,400,188, Cl. 62-13.000.

Air-Shields, Inc.: *See*—
Davidson, Ian H., 4,399,824, Cl. 128-736.000.
Donnelly, Michael M., 4,399,823, Cl. 128-736.000.

Aisaka, Tatsuyoshi; Kawai, Mituo; Hasegawa, Suteto; and Nawai, Takeo, to Tokyo Shibaura Denki Kabushiki Kaisha. Control rods. 4,400,346, Cl. 376-327.000.

Aisin Seiki Kabushiki Kaisha: *See*—
Katagiri, Masayoshi; Ogura, Osamu; and Fujii, Takashi, 4,399,735, Cl. 91-369.00B.
Kuromitsu, Hiromu; and Adachi, Yoshiharu, 4,400,602, Cl. 200-82.00C.

Akahane, Masao: *See*—
Takeda, Koji; Akahane, Masao; and Takayama, Chitoshi, 4,400,582, Cl. 179-1.0SM.

Akiyama, Kazuhiko; Yoshino, Takeshi; Shiina, Michihiro; Sato, Shigeo; Nishizawa, Tetsuo; Yoshida, Toshio; and Kobayashi, Nobuo, to Fuji Photo Optical Co., Ltd. Automatic rewinding camera. 4,400,074, Cl. 354-173.000.

Akro-Medic Engineering, Inc.: *See*—
Meserol, Peter M.; and Acker, Jesse L., 4,400,353, Cl. 422-73.000.

Aktiebolaget SKF: *See*—
Karlsson, Harry L.; and Norlander, Lars G., 4,399,878, Cl. 175-227.000.

Akzo NV: *See*—
Bos, Teunis M., 4,400,479, Cl. 524-38.000.

Akzona, Incorporated: *See*—
Rogers, Horace B., Jr., 4,399,597, Cl. 28-250.000.

Albany International Corp.: *See*—
Bishop, Clyde E.; and Morrow, Gary W., 4,400,550, Cl. 568-486.000.
Leunig, Carl V.; and Smith, Stewart W., 4,400,186, Cl. 55-379.000.

Albers, Karl: *See*—
Schwade, Hans; and Albers, Karl, 4,399,773, Cl. 122-390.000.

Albert, Stephen B.: *See*—
McNaughton, Allen D.; Albert, Stephen B.; and Furbershaw, Gerard A., 4,400,170, Cl. 604-62.000.

Albery, Wyndham J.; and Hahn, Clive E. W., to National Research Development Corporation. Electrochemical method of determining oxygen, halothane and nitrous oxide. 4,400,242, Cl. 204-1.00T.

Albrecht, James W.; and Spriggs, Harold G., to Stromag, Inc. Shaft mounted eddy current drive. 4,400,638, Cl. 310-95.000.

Albrecht, Konrad; and Langeluddeke, Peter, to Hoechst Aktiengesellschaft. Herbicidal compositions. 4,400,196, Cl. 71-86.000.

Alcan Aluminum Corporation: *See*—
Brown, John M., Jr., 4,400,026, Cl. 292-175.000.

Aldon Company, The: *See*—
Switzer, Ralph V., 4,399,893, Cl. 188-32.000.

Aldrich, William E., to Warnaco Inc. Thermal insulation material comprising a mixture of silk and synthetic fiber staple. 4,400,426, Cl. 428-290.000.

Alekhin, Stanislav A.: *See*—
Mamadzhanov, Ulmas D.; Bakhir, Vitold M.; Klimenko, Vladimir I.; Alekhin, Stanislav A.; and Zadorozhny, Jury G., 4,400,266, Cl. 209-130.000.

Alexander, Marvin C. Method of making dual-ply plant bed cover. 4,399,763, Cl. 112-262.300.

Alferness, Rodney C.; and Jackel, Janet L., to Bell Telephone Laboratories, Incorporated. Method for manufacturing birefringent integrated optics devices. 4,400,052, Cl. 350-96.120.

Alkner, Stig H. I.; and Soderstrom, Sture H., to Trelleborg AB. Floating container for receiving and transporting collected oil pollutants. 4,399,765, Cl. 114-256.000.

Allegheny Ludlum Steel Corporation: *See*—
Johns, Robert H., 4,399,860, Cl. 164-423.000.

Allen-Bradley Company: *See*—
Bartley, John E.; and Penrod, Orville R., 4,400,762, Cl. 361-402.000.

Allied Corporation: *See*—
Carlson, Charles E., 4,399,861, Cl. 164-453.000.
Mathew, Chempolil T.; and Ulmer, Harry E., 4,400,527, Cl. 556-422.000.
Nalewajek, David, 4,400,360, Cl. 423-21.100.
Wagner, Franz M., 4,400,450, Cl. 429-86.000.

Allied Paper Incorporated: *See*—
Shaw, Michael J., 4,400,440, Cl. 428-511.000.

Allis-Chalmers Corporation: *See*—
Ballendux, Gerardus M.; and Schott, Robert E., 4,399,900, Cl. 192-106.00F.

Alter, Eduard; Bruns, Ludwig; and Volprecht, Werner, to EC Erdolchemie GmbH. Silver-containing supported catalysts and catalyst intermediate products, processes for their preparation and their use. 4,400,308, Cl. 252-463.000.

Aluma-Form, Inc.: *See*—
Jarvis, Jack D., 4,399,583, Cl. 15-235.800.

Aluminium Pechiney: *See*—
Maurel, Pierre; and Nicolas, Francois, 4,400,359, Cl. 423-15.000.

Aluminum Company of America: *See*—
Heffner, Robert E.; and Davidson, John J., 4,400,251, Cl. 204-181.00R.

Alvarez, Jose A. A.; and Thompson, Ralph B., to T & R Chemicals, Inc. Antithrombotic treatment with organic amine sulfites and bisulfites. 4,400,396, Cl. 424-325.000.

Amemiya, Masahiro: *See—*
Hayashi, Yukihiro; Sueyoshi, Toshinobu; Hirai, Shigeo; Kishimoto, Mikio; Tashita, Katsunori; and Amemiya, Masahiro, 4,400,337, Cl. 264-82.000.

American Cyanamid Company: *See—*
Loffelman, Frank F.; and Brady, Thomas E., 4,400,505, Cl. 544-198.000.

American Hoechst Corporation: *See—*
Corso, Anthony J., 4,400,317, Cl. 260-151.000.

American Home Products Corporation: *See—*
Freed, Meier E., 4,400,511, Cl. 544-349.000.

American Industrial Research: *See—*
Johnson, Raynor A.; and Barrow, Ralph M., Jr., 4,399,885, Cl. 180-125.000.

American Plasticraft Company: *See—*
Simovits, Stephen J., Jr.; and Dumas, Christ J., 4,400,645, Cl. 313-325.000.

Amorin, Osvaldo: *See—*
De Souza Dias, Edson; Santos, Luiz D. D.; Teixeira, Joao C.; Amorin, Osvaldo; and Lamprecht, Antonio R. D. A., 4,399,846, Cl. 141-192.000.

AMP Incorporated: *See—*
Fukukura, Kazutoyo; and Lynn, William J., 4,400,596, Cl. 200-5.00A.

Amselem, Armand; Eloy, Fernand; and Maffrand, Jean-Pierre, to Sanofi, S.A. 5-o-Cyanobenzyl-4,5,6,7-tetrahydrothieno [3,2-c] pyridine methanesulfonate and other novel salts thereof. 4,400,384, Cl. 424-256.000.

Analog Devices, Incorporated: *See—*
Brokaw, Adrian P.; and Maidique, Modesto A., 4,400,689, Cl. 340-347.0AD.
Brokaw, Adrian P.; and Maidique, Modesto A., 4,400,690, Cl. 340-347.0AD.

Ancheta, Antonio. Two cycle internal combustion engine. 4,399,778, Cl. 123-65.0VB.

Anderson-Cook, Inc.: *See—*
Killop, James T., 4,399,678, Cl. 72-88.000.

Anderson, David G.; Bigenwald, John J.; and Fantuzzo, Joseph, to Xerox Corporation. Toner dispensing apparatus. 4,399,933, Cl. 222-407.000.

Anderson, Glenn W.; and Hutchison, Stanley O., to Chevron Research Company. Concentric steaming string downhole apparatus. 4,399,865, Cl. 166-191.000.

Anderson, Richard N., to Hunter Douglas, Inc. Adjustable valance suspension bracket. 4,399,856, Cl. 160-39.000.

Anderson, Roger N.: *See—*
Yuan, Han-Tzong; and Anderson, Roger N., 4,400,411, Cl. 427-86.000.

Anderson, Victor C.: *See—*
Spiess, Fred N.; and Anderson, Victor C., 4,400,803, Cl. 367-88.000.

Ando, Masahisa: *See—*
Kato, Keigo; Ando, Masahisa; and Kuroiwa, Yosio, 4,399,796, Cl. 123-549.000.

Ando, Shizuo: *See—*
Kamimura, Teturo; Komatsubara, Masahiro; Ando, Shizuo; Inanaga, Takuzi; and Takahashi, Akira, 4,400,744, Cl. 360-69.000.

Andrade, Thomas L., to International Business Machines Corporation. Threshold voltage tolerant logic. 4,400,636, Cl. 307-446.000.

Aneja, Viney P., to General Electric Company. Recovery of BPA and phenol from aqueous effluent streams. 4,400,553, Cl. 568-724.000.

Anglin, James R.: *See—*
Singerman, Gary M.; Ryu, Yumi P.; and Anglin, James R., 4,400,282, Cl. 252-32.70E.

Anttila, Arjo; and Tiitto, Reijo, to Valmet OY. Method and apparatus for handling and transporting a load. 4,400,130, Cl. 414-478.000.

Aoki, Eiichiro, to Nippon Gakki Seizo Kabushiki Kaisha. Apparatus for automatically composing music piece. 4,399,731, Cl. 84-1.030.

Aoki, Masanobu: *See—*
Noyori, Tatsuhiko; Ueda, Masakazu; Aoki, Masanobu; Kajima, Takashi; and Masuda, Tsuneharu, 4,399,676, Cl. 72-40.000.

Aotsuka, Kazuo: *See—*
Murakami, Masahiro; and Aotsuka, Kazuo, 4,400,610, Cl. 219-124.020.

Apcom, Inc.: *See—*
Fehrmann, George L.; and Stubblefield, Samuel M., Jr., 4,399,971, Cl. 248-221.300.

Appleby, Robert A., to Mundo Corporation, The. Air gap assembly. 4,399,832, Cl. 137-216.000.

Arai, Hiroshi: *See—*
Kosuge, Shuichi; Ogura, Hiroshi; Arai, Hiroshi; and Ohta, Hisatoshi, 4,400,779, Cl. 364-442.000.

Arai, Kiyoshi, to Sony Corporation. Method and apparatus for controlling a thermal color printer. 4,399,749, Cl. 101-211.000.

Arai, Tohru; Fujita, Hironori; and Takada, Yasuo, to Kabushiki Kaisha Toyota Chuo Kenkyusho. Method for forming a carbide layer on the surface of a ferrous alloy article or a cemented carbide article. 4,400,224, Cl. 148-15.000.

Arai, Yasunori: *See—*
Ogawa, Ryota; Oishi, Michiro; and Arai, Yasunori, 4,400,080, Cl. 355-11.000.

Arai, Yoshio; Kataoka, Hiroyuki; Suzuki, Isao; and Itoh, Satoru, to Fuji Xerox Co., Ltd. Apparatus for producing and reproducing embedded pattern. 4,400,737, Cl. 358-263.000.

Araki, Eiichi: *See—*
Takegami, Yoshinobu; Inui, Tomoyuki; Ishihara, Takayuki; Araki, Eiichi; and Kanie, Toshihiro, 4,400,328, Cl. 260-448.00C.

Arbed S.A.: *See—*
Metz, Paul, 4,399,983, Cl. 266-176.000.

Archambeault, William J.: *See—*
Clark, L. Dale; and Archambeault, William J., 4,400,812, Cl. 372-29.000.

Arguin, Gerard, to Arguin Trailer Frame, Inc. Tandem trailer system. 4,400,004, Cl. 280-408.000.

Arguin Trailer Frame, Inc.: *See—*
Arguin, Gerard, 4,400,004, Cl. 280-408.000.

Arias Alvarez, Jose A.; and Thompson, Ralph B., to T & R Chemicals, Inc. Antithrombotic treatment with quaternary ammonium sulfites and bisulfites. 4,400,397, Cl. 424-329.000.

Arima, Yaeno: *See—*
Ootsu, Yoshiro; and Arima, Yaeno, 4,400,295, Cl. 252-356.000.

Arimura, Ichiro: *See—*
Yamamitsu, Chojuro; Arimura, Ichiro; and Ohtsu, Masamitsu, 4,400,742, Cl. 358-318.000.

Arisaka, Oomi: *See—*
Yaotani, Kouichi; Yoshida, Minoru; and Arisaka, Oomi, 4,399,927, Cl. 220-307.000.

Arkenbout, Gerardus J.; van Kuijk, Albert; van der Meer, Johannes; and Schneiders, Leonardus H. J. M., to Nederlandse Centrale Organisatie voor Toegepast Natuurwetenschapplijk Onder Zoek. Pulsed crystallization column and method of countercurrent crystallization. 4,400,189, Cl. 62-538.000.

Arlt, Dieter: *See—*
Jautelat, Manfred; Arlt, Dieter; Lantzsch, Reinhard; Fuchs, Rainer; Riebel, Hans-Jochem; Schroder, Rolf; and Harnisch, Horst, 4,400,523, Cl. 549-320.000.

Armtec Industries, Inc.: *See—*
Heline, Ture A., Jr., 4,400,680, Cl. 337-415.000.

Arnold, Fred E.: *See—*
Reinhardt, Bruce A.; and Arnold, Fred E., 4,400,540, Cl. 568-31.000.

Aron, Mitchell, to Bendix Corporation, The. Moving map display. 4,400,727, Cl. 358-103.000.

Arora, Manohar L., to BASF Wyandotte Corp. Method for preparing bleed resistant lithographic inks. 4,400,216, Cl. 106-23.000.

Arrant, Kearney D., to Monsanto Company. Manipulating large sections of artificial turf. 4,399,954, Cl. 242-86.520.

Artes, Reinhold; Frey, Volker; Graf, Werner; and Zeller, Norbert, to Wacker-Chemie GmbH. Process for methylating silicon compounds. 4,400,528, Cl. 556-430.000.

Arzoumanidis, Gregory G.; and Tovrog, Benjamin S., to Standard Oil Company (Indiana). Olefin polymerization catalyst. 4,400,494, Cl. 526-119.000.

Asahi Kasei Kabashiki Kaisha: *See—*
Yokoyama, Shigeo; Misumi, Teruyuki; Fujimoto, Einosuke; and Kobayashi, Yutaka, 4,400,199, Cl. 71-88.000.

Asahi Kogaku Kogyo Kabushiki Kaisha: *See—*
Ogawa, Ryota; Oishi, Michiro; and Arai, Yasunori, 4,400,080, Cl. 355-11.000.
Tomori, Yasumasa; and Shimoda, Mituhiko, 4,400,075, Cl. 354-195.000.

Asami, Fumitaka; and Takagi, Osamu, to Fujitsu Limited. Programmable counter circuit. 4,400,615, Cl. 377-28.000.

Asano, Hiroshi; Shimamune, Takayuki; Goto, Toshiki; Nitta, Hideo; and Hosonuma, Masashi, to Permelec Electrode Ltd. Method for forming an anticorrosive coating on a metal substrate. 4,400,408, Cl. 427-35.000.

Asano, Makoto; Kawashima, Saburo; Tanabe, Yoshimitu; and Murakami, Hisamichi, to Mitsui Toatsu Chemicals, Inc. Color-developer for pressure-sensitive recording sheets. 4,400,492, Cl. 525-506.000.

Ashton, W. Ronald: *See—*
Morley, Robert G.; and Ashton, W. Ronald, 4,400,405, Cl. 426-565.000.
Morley, Robert G.; and Ashton, W. Ronald, 4,400,406, Cl. 426-565.000.

Associated Engineering Limited: *See—*
Caldwell, Kenneth B., 4,400,757, Cl. 361-236.000.

Atkey, Richard E., to Dover Corporation. Force and kinetic energy measuring device. 4,399,685, Cl. 73-11.000.

Atlantic Pipe Corporation: *See—*
Toffolon, Roger L.; and Kart, Warren E., 4,400,149, Cl. 425-262.000.

Atlantic Richfield Company: *See—*
Dearth, James D., 4,399,866, Cl. 166-245.000.
Dehm, David C., 4,400,281, Cl. 252-8.600.
Kutta, Helmuth W., 4,400,176, Cl. 44-1.00R.
Nemet-Mavrodin, Margaret I.; and White, John F., 4,400,558, Cl. 568-810.000.
Wolcott, Herbert B., 4,399,867, Cl. 166-261.000.

aus der Funten, Helmut; and Schrage, Klaus, to Dynamit Nobel Aktiengesellschaft. Method of preparing d,l-phenylalanine. 4,400,533, Cl. 562-443.000.

Austin, Peter W.; and Fishwick, Brian R., to Imperial Chemical Industries Limited. Disperse monoazo dyestuffs. 4,400,322, Cl. 260-205.000.

Avery, Leslie R., to RCA Corporation. Integrated circuit protection device. 4,400,711, Cl. 357-43.000.

Aviram, Ari; and Ellmann, Susan O., to International Business Machines Corp. Four layered ribbon for electrothermal printing. 4,400,100, Cl. 400-120.000.

Axel Johnson Engineering, AB: *See—*
Larsson, Hans F.; and Hakansson, Sven, 4,400,280, Cl. 210-802.000.

Ayers, Ray R., to Shell Oil Company. Method of preparing and using a pressure actuated release mechanism. 4,399,601, Cl. 29-407.000.

Azegami, Hitoshi: *See—*
Yoda, Kuniichi; Ohkawa, Takehisa; and Azegami, Hitoshi, 4,400,435, Cl. 428-425.900.

Azoulay, Edgard E. Y., to Dumas & Inchauspe. Process for the preparation of viscous water by action of micro-organisms. 4,400,466, Cl. 435-101.000.

B. F. Goodrich Company, The: *See—*
Lane, Parley C., Jr.; Tenney, Linwood P.; and Wootton, Gerald V., 4,400,501, Cl. 528-496.000.
Yang, Wei-Yeih W., 4,400,490, Cl. 525-423.000.

Baba, Kousaku: *See—*
Endo, Hiroshi; and Baba, Kousaku, 4,399,779, Cl. 123-146.50A.

Bacher, Michel: *See—*
Billet, Rene; and Bacher, Michel, 4,399,897, Cl. 192-89.00B.

Bachorik, Joan E. Pneumatic therapeutic heel and ankle guard. 4,399,815, Cl. 128-153.000.

Baer, William F. Multiple jet eductor. 4,400,138, Cl. 417-179.000.

Bagnall, Arthur F., to Spencer Wright Industries, Inc. Mechanism for improving tufting machine needle bar shifting. 4,399,758, Cl. 112-79.00R.

Bahnson Company, The: *See—*
Lamar, Roger H., 4,399,864, Cl. 165-20.000.

Baillie, Robert A. Safe grip slicer for bagels, rolls, muffins and the like. 4,399,989, Cl. 269-87.200.

Bair, Wolfgang: *See—*
Rosenthal, Heinrich; Schinkel, Ingo; Eger, Gunter; and Bair, Wolfgang, 4,400,428, Cl. 428-349.000.

Baker International Corporation: *See—*
Brose, Donald D., 4,400,267, Cl. 209-211.000.

Bakhir, Vitold M.: *See—*
Mamadzhanov, Ulmas D.; Bakhir, Vitold M.; Klimenko, Vladimir I.; Alekhin, Stanislav A.; and Zadorozhny, Jury G., 4,400,266, Cl. 209-130.000.

Bakken, Wendell J.; and Ferguson, Phillip R., to Boeing Company, The. Drip shield and thermal insulation cover. 4,400,420, Cl. 428-99.000.

Baldwin Piano & Organ Company: *See—*
Uetrecht, Dale M., 4,400,668, Cl. 331-45.000.

Ballendux, Gerardus M.; and Schott, Robert E., to Allis-Chalmers Corporation. Centrifugal hydraulic head relief valve. 4,399,900, Cl. 192-106.00F.

Banasiuk, Hubert A., to Institute of Gas Technology. Floating seal system for rotary devices. 4,399,863, Cl. 165-9.000.

Bank Building & Equipment Corporation of America: *See—*
Wiedmann, Paul R., 4,399,755, Cl. 109-2.000.

Barbee, Steven G.; Leas, James M.; Lloyd, James R.; and Nagarajan, Arunachala, to International Business Machines Corporation. Thin film semiconductor device and method for manufacture. 4,400,715, Cl. 357-49.000.

Barber, Forest C. Apparatus and method for removing a prosthesis embedded in skeletal bone. 4,399,813, Cl. 128-92.0EC.

Bard, Ronald E.; Gorges, Friedrich J.; and Halsey, Robert M., to Boeing Company, The. Aircraft floor panel installation system. 4,399,642, Cl. 52-483.000.

Baright, Leslie I., to Simmons U.S.A. Corporation. Reinforced box spring frame. 4,399,573, Cl. 5-239.000.

Barker, A. Clifford, to Navidyne Corporation. Method and apparatus for overcoming certain destabilizing torques on gyro-stabilized platforms. 4,399,714, Cl. 74-5.100.

Barker, Michael D.: *See—*
Orr, Alexander F.; and Barker, Michael D., 4,400,198, Cl. 71-88.000.

Barlow, Anthony; and Maringer, Melvin F., to National Distillers and Chemical Corporation. Tree retardant additive composition for polymeric insulation. 4,400,429, Cl. 428-379.000.

Baro, Juan V.; and Hurtado, Hector O. Artificial sphincter for use at stoma, or for the like purposes. 4,399,809, Cl. 128-1.00R.

Baron, Kenneth: *See—*
Jessup, Peter; Holstedt, Richard A.; and Baron, Kenneth, 4,400,284, Cl. 252-49.600.

Barrett, Troy G.: *See—*
Lee, Jack E.; and Barrett, Troy G., 4,400,141, Cl. 417-360.000.

Barron, Benjamin; and Rao, S. Chandrasekhara. Methods and apparatus for maximizing and stabilizing electric power derived from wind driven source. 4,400,659, Cl. 322-32.000.

Barrow, Ralph M., Jr.: *See—*
Johnson, Raynor A.; and Barrow, Ralph M., Jr., 4,399,885, Cl. 180-125.000.

Barsi, Karoly; Salamon, Hugo; Solymos, Andras; Takacs, Jozsef; and Toth, Istvan, to Tatabanyai Szenbanyak. Process for the extraction of thick coal seams. 4,400,035, Cl. 299-11.000.

Bartels, Leroy R.; Lawson, John H.; and King, Paul L., to International Telephone and Telegraph Corporation. Independently mounted fall prevention apparatus. 4,399,890, Cl. 182-100.000.

Bartley, John E.; and Penrod, Orville R., to Allen-Bradley Company. Edge termination for an electrical circuit device. 4,400,762, Cl. 361-402.000.

Barton Valve Company, Inc.: *See—*
Wheatley, Charles, 4,399,977, Cl. 251-315.000.

Baschin, Horst, to Neff-Werke Carl Neff GmbH. Built-in kitchen unit. 4,400,045, Cl. 312-236.000.

BASF Aktiengesellschaft: *See—*
Blum, Adolf; and Grund, Norbert, 4,400,174, Cl. 8-456.000.
Blum, Rainer; Lehner, August; and Schenck, Hans-Uwe, 4,400,497, Cl. 528-45.000.
Richter, Wolfgang; Kummer, Rudolf; and Schwirten, Kurt, 4,400,549, Cl. 568-454.000.

BASF Wyandotte Corp.: *See—*
Arora, Manohar L., 4,400,216, Cl. 106-23.000.

Baskent, Feyyaz O.; and Reedy, James D., to Union Carbide Corporation. Preparation of siloxylated metal-containing catalysts. 4,400,327, Cl. 260-429.00R.

Bastenhof, Dirk, to Eco-Pool Design Limited. Pressure filter for liquid, in particular water. 4,400,273, Cl. 210-284.000.

Batson, Bruce L. Apparatus for cleaning flues. 4,399,584, Cl. 15-243.000.

Battaglia, Eugene: *See—*
Kober, Marvin; and Battaglia, Eugene, 4,399,844, Cl. 140-106.000.

Batzer, Hans; and Sinnreich, Joel, to Ciba-Geigy Corporation. Cation-selective liquid membranes and their use. 4,400,296, Cl. 252-364.000.

Bauck, Randall C.; Kleczkowski, S. Peter; and Radman, Anton J., to Iomega Corporation. Flexible magnetic disk drive using a rigid cartridge. 4,400,748, Cl. 360-99.000.

Bauer, Keith A.; and Khosrovi, Behzad, to Standard Oil Company (Indiana). Process of using xanthomonas campestris NRRL B-12075 and NRRL B-12074 for making heteropolysaccharide. 4,400,467, Cl. 435-104.000.

Bauge, Michel G.; and Mollier, Pierre B., to International Business Machines Corp. Matrix array of semiconducting elements. 4,400,713, Cl. 357-45.000.

Baugh, John L.; Montgomery, James W.; and Manderscheid, Phillip H., to Hughes Tool Company. Annulus operated test valve. 4,399,870, Cl. 166-324.000.

Bauman, Douglas A.: *See—*
Mandel, Alan F.; Eichler, Kenneth M.; and Bauman, Douglas A., 4,400,786, Cl. 364-513.000.

Baumann, Hans D. Chemically inert control valve. 4,399,834, Cl. 137-375.000.

Bayer Aktiengesellschaft: *See—*
Buxbaum, Gunter; Pflugmacher, Ingo; Hund, Franz; Hahnkamm, Volker; and Woditsch, Peter, 4,400,432, Cl. 428-403.000.
Dhein, Rolf; and Fleiter, Lothar, 4,400,489, Cl. 525-301.500.
Haas, Peter; Muller, Heinz; Seifert, Peter; Wagner, Kuno; Findeisen, Kurt; and Konig, Klaus, 4,400,331, Cl. 260-932.000.
Harms, Wolfgang; and Wunderlich, Klaus, 4,400,504, Cl. 544-76.000.
Jauteiat, Manfred; Arlt, Dieter; Lantzsch, Reinhard; Fuchs, Rainer; Riebel, Hans-Jochem; Schroder, Rolf; and Harnisch, Horst, 4,400,523, Cl. 549-320.000.
Kafer, Peter; Morbitzer, Leo; Nouvertne, Werner; and Neuray, Dieter, 4,400,491, Cl. 525-439.000.
Linhart, Karl; Gleinig, Harald; Raue, Roderich; and Kuhlthau, Hans-Peter, 4,400,321, Cl. 260-186.000.
Martinola, Friedrich, 4,400,278, Cl. 210-678.000.
Rathjen, Claus; and Ullrich, Martin, 4,400,175, Cl. 23-295.00R.
Reinehr, Ulrich; Herbertz, Toni; Jungverdorben, Hermann J.; and Dross, Joachim, 4,400,339, Cl. 264-206.000.
Richter, Roland; Muller, Hanns P.; Wagner, Kuno; Helm, Rudolf; and Zander, Jurgen, 4,400,560, Cl. 568-863.000.
Springer, Carl M.; Theis, Bernd O.; Wawra, Georg; and Juffa, Richard, 4,400,147, Cl. 418-206.000.
Timmler, Helmut; Buchel, Karl H.; Brandes, Wilhelm; Frohberger, Paul-Ernst; and Scheinpflug, Hans, 4,400,388, Cl. 424-269.000.

Bazlen, Dieter; Bock, Dietrich W.; Getzlaff, Klaus J.; Hajdu, Johann; and Painke, Helmut, to International Business Machines Corporation. Data processor control subsystem. 4,400,776, Cl. 364-200.000.

BBC Brown, Boveri & Company, Limited: *See—*
Klein, Reto, 4,400,692, Cl. 340-347.0DA.

Beard, Robert: *See—*
Advani, Gulu N.; Beard, Robert; and Nanis, Leonard, 4,399,684, Cl. 73-1.00G.

Bearden, Roby, Jr.; and Schucker, Robert C., to Exxon Research and Engineering Co. Fluid coking with the addition of polymetaphosphoric acid catalysts. 4,400,262, Cl. 208-8.00R.

Beauchamp, Gerson E.: *See—*
Minnis, Ralph L.; Ragas, Frank J.; and Beauchamp, Gerson E., 4,400,441, Cl. 428-514.000.

Beauger, Alain: *See—*
Lagrange, Alain; and Beauger, Alain, 4,400,759, Cl. 361-321.000.
Lagrange, Alain; and Beauger, Alain, 4,400,760, Cl. 361-321.000.

Beauvais, Max P.; and Camezon, Raymond E. Method of microwave sterilizing canned food. 4,400,401, Cl. 426-234.000.

Beavan, Stuart W., to Lever Brothers Company. Bleach composition containing weakly to non-colored porphine photo-activator. 4,400,173, Cl. 8-107.000.

Beazley, Rodney T.; and Haggett, Mervyn T., to Glacier Metal Company Limited, The. Centrifugal separator. 4,400,167, Cl. 494-49.000.

Bechara, Ibrahim S.; and Mascioli, Rocco L., to Air Products and Chemicals, Inc. Paint adhesion for RIM parts. 4,400,476, Cl. 521-107.000.

Bechthold, Paul S.; and Chatzipetros, Johann, to Kernforschungsanlage Julich GmbH. Temperature-controlled sample cell for photoacoustic spectroscopy. 4,399,689, Cl. 73-24.000.

Beckman Instruments, Inc.: *See—*
Chulay, Steven J.; and Crotty, Daniel G., 4,400,166, Cl. 494-20.000.
Klein, Gerald L., 4,399,711, Cl. 73-864.160.

Beebe, William E.; and Duff, Dean R., to International Business Machines Corporation. Universal magnetic recording disk cartridge. 4,400,753, Cl. 360-133.000.

Behlmer, Wilbur D., to Deere & Company. Steering brake and clutch control. 4,399,896, Cl. 192-13.00R.
Beisty, James M.; Miller, Robert J.; and Romeo, Albert J., to Decision Data Computer Corporation. Electrostatic printer drum improvements. 4,400,083, Cl. 355-16.000.
Belkin, Martin, to Sangamo Weston, Inc. Phase tolerant bit synchronizer for digital signals. 4,400,667, Cl. 331-1.00A.
Bell Telephone Laboratories, Incorporated: *See*—
Alferness, Rodney C.; and Jackel, Janet L., 4,400,052, Cl. 350-96.120.
Berkstresser, George W.; and Blank, Stuart L., 4,400,445, Cl. 428-700.000.
Chandross, Edwin A.; Reichmanis, Elsa; and Wilkins, Cletus W., Jr., 4,400,461, Cl. 430-311.000.
Cheng, Julian, 4,400,060, Cl. 350-339.00R.
Coquin, Gerald A.; Moran, Joseph M.; and Taylor, Gary N., 4,400,235, Cl. 156-643.000.
Ebert, Harry K., Jr., 4,400,624, Cl. 307-43.000.
Fork, Richard L.; Greene, Benjamin I.; and Shank, Charles V., 4,400,814, Cl. 372-94.000.
Fulton, Theodore A., 4,400,631, Cl. 307-245.000.
Ingaglio, Michael L., 4,399,608, Cl. 29-747.000.
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Kaminow, Ivan P., 4,400,813, Cl. 372-45.000.
May, Paul H., 4,400,663, Cl. 324-52.000.
Myers, Cory S.; Pirz, Frank C.; and Rabiner, Lawrence R., 4,400,788, Cl. 364-513.000.
O'Connor, Kevin J., 4,400,712, Cl. 357-44.000.
Pirz, Frank C.; Rabiner, Lawrence R.; and Wilpon, Jay G., 4,400,828, Cl. 382-30.000.
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Zola, Meyer J., 4,400,627, Cl. 307-115.000.
Belorussky Politekhnichesky Institute: *See*—
Shutov, Gennady M.; Erdman, Maiya E.; Solomakha, Adel I.; and Kalennikov, Evgeny A., 4,400,495, Cl. 524-176.000.
Ben-Bassat, Arie: *See*—
Zeikus, Joseph G.; Ng, Thomas K.; Ben-Bassat, Arie; and Lamed, Raphael J., 4,400,470, Cl. 435-162.000.
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Clements, Stanley, 4,399,918, Cl. 211-113.000.
Benardelli, Giovanni, to Linnea S.A. Partial synthesis process for preparing (+)-vincamine and related indolic alkaloids. 4,400,249, Cl. 204-158.00R.
Bendix Corporation, The: *See*—
Aron, Mitchell, 4,400,727, Cl. 358-103.000.
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Bens, Jean; Bloch, Marcel; Chekroun, Rene; and Klausz, Remy, to Compagnie Generale de Radiologie. Device for the accurate anatomical locating of tomodensitometric sections. 4,400,819, Cl. 378-20.000.
Bentley, Norman P., to Charlies Rental. Pipe wiping method and apparatus. 4,399,869, Cl. 166-311.000.
Beranger, Serge: *See*—
Favier, Colette; Pinhas, Henri; Beranger, Serge; and Pascal, Jean-Claude, 4,400,381, Cl. 424-248.520.
Berg, William E., to Tektronix, Inc. Method of manufacturing electrical connector. 4,400,234, Cl. 156-634.000.
Bergemann GmbH: *See*—
Schwade, Hans; and Albers, Karl, 4,399,773, Cl. 122-390.000.
Bergvall, Bengt A., to Husqvarna Aktiebolag. Input selector for an electronic sewing machine. 4,399,759, Cl. 112-158.00E.
Bergvall, Bengt A., to Husqvarna Aktiebolag. Sewing machine for fancy seams. 4,399,760, Cl. 112-158.00E.
Bergwerksverband GmbH: *See*—
Grochowski, Horst; and Knoblauch, Karl, 4,400,363, Cl. 423-239.000.
Berkstresser, George W.; and Blank, Stuart L., to Bell Telephone Laboratories, Incorporated. Liquid phase epitaxial growth of garnet films. 4,400,445, Cl. 428-700.000.
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Kruger, Horst; Berndt, Wilhelm; and Suss, Hans U., 4,400,237, Cl. 162-76.000.
Beroth, Wesley H. Chugometer. 4,400,090, Cl. 368-9.000.
Berry, Clyde F. Steam generation system. 4,399,657, Cl. 60-664.000.
Bertini, Milo. Target launcher. 4,399,803, Cl. 124-1.000.
Beuth, Paul: *See*—
Koschnitzke, Walter; and Beuth, Paul, 4,400,097, Cl. 374-121.000.
Beynet, Pierre A.; and Billington, Sam A., to Standard Oil Company (Indiana). Flexible riser underwater buoy. 4,400,110, Cl. 405-195.000.
Bhise, Vijay S., to Halcon SD Group, Inc., The. Process for preparing ethylene glycol. 4,400,559, Cl. 568-858.000.
Biancale, Pierre; Corfa, Yves-Paul; Lemercier, Pierre; Moreau, Jean-Pierre; and Vertut, Jean, to Commissariat a l'Energie Atomique. Method for depositing material on the ocean bed and apparatus for performing the same. 4,400,115, Cl. 405-303.000.
Biard, James R.; Shaunfield, John E.; and Speer, Royce S., to Spectronics, Inc. Passive optical coupler. 4,400,054, Cl. 350-96.150.
Biddle, Howard W., to Ofrex Group Limited. Tacker. 4,399,938, Cl. 227-132.000.
Bigenwald, John J.: *See*—
Anderson, David G.; Bigenwald, John J.; and Fantuzzo, Joseph, 4,399,933, Cl. 222-407.000.
Bijlenga, Gosse, to Gist-Brocades N.V. Novel rabies virus strain and a process for its preparation. 4,400,472, Cl. 435-235.000.
Billerbeck, Fred W.: *See*—
Vibbert, Bruce L.; Billerbeck, Fred W.; and Hoersten, Kenneth P., 4,400,402, Cl. 426-471.000.
Billet, Rene; and Bacher, Michel, to Valeo. Diaphragm clutch mechanism. 4,399,897, Cl. 192-89.00B.
Billig, Ernst: *See*—
Abatjoglou, Anthony G.; and Billig, Ernst, 4,400,548, Cl. 568-454.000.
Billington, Sam A.: *See*—
Beynet, Pierre A.; and Billington, Sam A., 4,400,110, Cl. 405-195.000.
Binks Manufacturing Company: *See*—
Dobias, Frank L., 4,399,742, Cl. 98-115.0SB.
Springer, Carl M.; Theis, Bernd O.; Wawra, Georg; and Juffa, Richard, 4,400,147, Cl. 418-206.000.
Biocarn Ltd.: *See*—
De Felice, Stephen L., 4,400,371, Cl. 424-10.000.
Biomedical Engineering Corp.: *See*—
Buechel, Frederick F.; Pappas, Michael J.; and Witte, Paul A., 4,400,168, Cl. 604-48.000.
Bishop, Clyde E.; and Morrow, Gary W., to Albany International Corp. Synthesis of the navel orange worm pheromone (Z,Z)-11,13-hexadecadienal. 4,400,550, Cl. 568-486.000.
Black & Decker Inc.: *See*—
Rodowsky, Stanley, Jr.; and Nicholson, R. Kent, 4,399,638, Cl. 51-170.00R.
Blackwell, Donald W., to Pozzi Window Company, Inc. Thermal insulated doorsill apparatus with insulating spacer fastener. 4,399,636, Cl. 49-469.000.
Blake, Laurence S.: *See*—
St. Pierre, Alfred J.; Darnstaedt, Dann; and Blake, Laurence S., 4,400,069, Cl. 354-11.000.
Blake, Nolen C., to Marmon Group, Inc., The. Compressed air discharge system for trucks. 4,400,131, Cl. 414-491.000.
Blanchard, Clarence E., to Outboard Marine Corporation. Marine propulsion device including an overdrive transmission. 4,400,163, Cl. 440-75.000.
Blank, Stuart L.: *See*—
Berkstresser, George W.; and Blank, Stuart L., 4,400,445, Cl. 428-700.000.
Blanpied, Robert H. Copolyester polyol resins, foamable blends comprising the same, and resultant polyisocyanurate foams. 4,400,477, Cl. 521-112.000.
Bloch, Marcel: *See*—
Bens, Jean; Bloch, Marcel; Chekroun, Rene; and Klausz, Remy, 4,400,819, Cl. 378-20.000.
Blom, Ingvar G. A.: *See*—
Ivarsson, Lennart P.; and Blom, Ingvar G. A., 4,400,335, Cl. 264-30.000.
Blomgren, George E.; and Kronenberg, Marvin L., to Union Carbide Corporation. Non-aqueous electrochemical cell. 4,400,453, Cl. 429-196.000.
Bloy, Graham P., to Metme Communications. Complete audio processing system. 4,400,583, Cl. 179-1.00D.
Blum, Adolf; and Grund, Norbert, to BASF Aktiengesellschaft. Process for printing on synthetic fibers: reducing agent and alkoxylated amine for discharge. 4,400,174, Cl. 8-456.000.
Blum, Alvin S. Photon emission tomographic apparatus. 4,400,620, Cl. 250-363.00S.
Blum, Rainer; Lehner, August; and Schenck, Hans-Uwe, to BASF Aktiengeselischaft. Storage stable, heat curable mixtures of polyisocyanate and polyol and process for their manufacture and use. 4,400,497, Cl. 528-45.000.
Bock, Dietrich W.: *See*—
Bazlen, Dieter; Bock, Dietrich W.; Getzlaff, Klaus J.; Hajdu, Johann; and Painke, Helmut, 4,400,776, Cl. 364-200.000.
Bock, Thomas: *See*—
Wirtzfeld, Alexander; Heinze, Roland; Bock, Thomas; and Liess, Hans D., 4,399,820, Cl. 128-419.0PG.
Boden, Richard M.: *See*—
Licciardello, Michael; Boden, Richard M.; Watkins, Hugh; and Hanna, Marie R., 4,400,290, Cl. 252-174.110.
Boeing Company, The: *See*—
Bakken, Wendell J.; and Ferguson, Phillip R., 4,400,420, Cl. 428-99.000.
Bard, Ronald E.; Gorges, Friedrich J.; and Halsey, Robert M., 4,399,642, Cl. 52-483.000.
Carpenter, Dennis O.; and Ceola, Robert E., 4,400,789, Cl. 364-578.000.
Crudden, Eric H.; and Jessen, P. Jay, 4,399,966, Cl. 244-129.400.
Erdmann, Joachim C.; Gellert, Robert I.; and Jeppsson, Jan, 4,399,675, Cl. 72-37.000.
Evans, Arthur, 4,399,970, Cl. 244-214.000.
Kenyon, Bruce A., 4,400,764, Cl. 362-263.000.
Vandehey, Marvin E., 4,399,884, Cl. 180-79.100.
Boggi, John J.; Centrone, Gerald V.; Dolin, Aaron M.; and Sherman, Ira N., to General Electric Co. Adjustable slit radiographic apparatus. 4,400,825, Cl. 378-150.000.
Boichenko, Oleg L.: *See*—
Vishnevsky, Vladimir S.; Koval, Vitaly S.; Lavrinenko, Vyacheslav V.; Boichenko, Oleg L.; Kartashev, Igor A.; Golovyashin, Jury V.; Serov, Nikolai F.; Shinkarenko, Leonid I.; and Jurash, Oleg G., 4,400,641, Cl. 310-323.000.
Bollinger, Wayne A.; and Guay, Roger G., to Monsanto Company. Apparatus having tube sheets for hollow fibers. 4,400,276, Cl. 210-323.200.

Bombardier-Rotax Gesellschaft mbH: *See*—
Bostelmann, Willy, 4,399,788, Cl. 123-323.000.
Boocock, Denis; and Kimber, Barbara M., to Borax Holdings Limited. Wood preservative compositions. 4,400,298, Cl. 252-400.00R.
Booker, Arthur J. Ships screw and rudder removal apparatus. 4,400,133, Cl. 414-589.000.
Borax Holdings Limited: *See*—
Boocock, Denis; and Kimber, Barbara M., 4,400,298, Cl. 252-400.00R.
Bordeaux, Willard A. Tool for cleaning bathtub. 4,399,578, Cl. 15-97.00R.
Bos, Teunis M., to Akzo NV. Paint adapted for use as repair paint for damaged painted surfaces. 4,400,479, Cl. 524-38.000.
Boschi, Pier M.: *See*—
Gozzo, Franco; Boschi, Pier M.; and Longoni, Angelo, 4,400,517, Cl. 548-118.000.
Bossi, Emilio: *See*—
Cucelli, Andrea; Brizzolesi, Gustavo; and Bossi, Emilio, 4,399,987, Cl. 267-140.100.
Bostelmann, Willy, to Bombardier-Rotax Gesellschaft mbH. Internal combustion engine comprising means for controlling the axial extent of an exhaust port in a cylinder. 4,399,788, Cl. 123-323.000.
Boswell, Bennie J.: *See*—
Schaaf, Wayne J.; and Boswell, Bennie J., 4,399,875, Cl. 172-311.000.
Bottelson, Thomas J., to Gulf & Western Manufacturing Company. Relay mounting device. 4,400,672, Cl. 335-202.000.
Bouchon, Jean-Claude M., to Midland-Ross Corporation. Automatic installation for the heat treatment of workpieces in fluidized beds. 4,399,984, Cl. 266-252.000.
Bowers, David L. Free moving animal physiological monitoring and identification system and method. 4,399,821, Cl. 128-630.000.
Bowyer, John M.; Flower, George W.; and Maluke, Edward M., to Goodyear Aerospace Corporation. Solid state switch. 4,399,752, Cl. 102-217.000.
Boyce, Gary C. Practice bat. 4,399,996, Cl. 273-26.00B.
Boyd, Thomas E.: *See*—
Chadwick, David H.; and Boyd, Thomas E., 4,400,538, Cl. 564-423.000.
Bradley, John A. Corner-cutting mining assembly. 4,400,036, Cl. 299-86.000.
Brady, Thomas E.: *See*—
Loffelman, Frank F.; and Brady, Thomas E., 4,400,505, Cl. 544-198.000.
Braithwaite, David G.; Cheavens, Thomas; and Voyce, Jason M., to Improtec. Extractive distillation process for the production of fuel grade alcohols. 4,400,241, Cl. 203-18.000.
Brand, Wilhelm: *See*—
Chszaniecki, Siegfried; and Brand, Wilhelm, 4,399,719, Cl. 74-410.000.
Brandenstein, Manfred: *See*—
Olschewski, Armin; Brandenstein, Manfred; Walter, Lothar; and Kunkel, Heinrich, 4,399,898, Cl. 198-98.000.
Brandes, Wilhelm: *See*—
Timmler, Helmut; Buchel, Karl H.; Brandes, Wilhelm; Frohberger, Paul-Ernst; and Scheinpflug, Hans, 4,400,388, Cl. 424-269.000.
Braun, Albert; Portz, Willi; Strauss, Georg; and Delhey, Hans-Martin, to Hoechst Aktiengesellschaft. Process for making agents for desulfurizing crude iron or steel melts. 4,400,292, Cl. 252-189.000.
Braunkohlen Kraftstoff Aktiengesellschaft: *See*—
Fremery, Max; and Korff, Joachim, 4,400,557, Cl. 568-804.000.
Brautigam, Peter F.: *See*—
O'Neill, Michael J.; Brautigam, Peter F.; and Stricker, David K., 4,399,882, Cl. 180-6.480.
Braverman, Mel; and Lazar, Joseph. Photo display device. 4,399,626, Cl. 40-530.000.
Breininger, J. Shannon; and Greenberg, Charles B., to PPG Industries, Inc. Direct electroless deposition of cuprous oxide films. 4,400,436, Cl. 428-434.000.
Bremer, Noel J.: *See*—
Dria, Dennis E.; and Bremer, Noel J., 4,400,306, Cl. 252-431.00R.
Brendle, Ralph N.: *See*—
Keller, Margaret S.; and Brendle, Ralph N., 4,400,320, Cl. 260-158.000.
Brent, Albert: *See*—
Marion, Charles P.; Brent, Albert; Richter, George N.; Crouch, William B.; Child, Edward T.; and Reynolds, Blake, 4,400,179, Cl. 48-86.00R.
Marion, Charles P.; Crouch, William B.; Brent, Albert; Richter, George N.; Child, Edward T.; and Reynolds, Blake, 4,400,180, Cl. 48-197.00R.
Breward, Michael J.; and Ritchie, Andrew M. F., to SKF Industrial Trading and Development Co. B.V. Clutch release bearings. 4,399,899, Cl. 192-98.000.
Bridgestone Tire Co., Ltd.: *See*—
Morimoto, Masaaki; Kusakabe, Noboru; Kojima, Koichi; and Koyama, Eiichi, 4,399,853, Cl. 152-359.000.
Briere, Alfred D., to GTE Laboratories Incorporated. Graphite element for use in a furnace for drawing optical fiber. 4,400,190, Cl. 65-13.000.
Bright, Robert G., to Draftex Development AG. Channel-shaped strips. 4,399,644, Cl. 52-716.000.
Brima, Thomas S.; and Cottingham, Auburn B., to National Distillers and Chemical Corporation. Process for preparing anthraquinone. 4,400,324, Cl. 260-369.000.
British Gas Corporation: *See*—
Davies, Haydn S.; Garstang, James H.; and Timmins, Cyril, 4,400,182, Cl. 48-214.00A.
Brizzolesi, Gustavo: *See*—
Cucelli, Andrea; Brizzolesi, Gustavo; and Bossi, Emilio, 4,399,987, Cl. 267-140.100.
Brodie, George W., to IMI Marston Limited. Safety pressure relief device assembly. 4,399,830, Cl. 137-68.00R.
Brokaw, Adrian P.; and Maidique, Modesto A., to Analog Devices, Incorporated. A-to-D Converter of the successive-approximation type. 4,400,689, Cl. 340-347.0AD.
Brokaw, Adrian P.; and Maidique, Modesto A., to Analog Devices, Incorporated. A-to-D Converter of the successive-approximation type. 4,400,690, Cl. 340-347.0AD.
Broken, Erich. Sealing bush unit for sealing reciprocating machine parts. 4,399,997, Cl. 277-12.000.
Brooks, Frank W.: *See*—
Price, Harry S., III; and Brooks, Frank W., 4,399,677, Cl. 72-40.000.
Brooks, Maxim C.: *See*—
Dhanani, Shafiq; MacDonald, Ronald; Clunie, James S.; and Brooks, Maxim C., 4,400,288, Cl. 252-135.000.
Brose, Donald D., to Baker International Corporation. Seal structure for hydrocyclones. 4,400,267, Cl. 209-211.000.
Brown, Don B., to Jade Corporation. Lead frame for semiconductor chip. 4,400,714, Cl. 357-70.000.
Brown, Henry C.; and Mueller, Fredrick N., to Camsco, Inc. Plotter having continuously moving carbon paper handling system. 4,400,704, Cl. 346-29.000.
Brown, James H.; and Grande, Johannes, to Rockwell International Corporation. Detecting accurrences of redundant digital codewords. 4,400,811, Cl. 371-69.000.
Brown, John M., Jr., to Alcan Aluminum Corporation. Tilt latch for window sash. 4,400,026, Cl. 292-175.000.
Brown, M. Wayne, to IPT Corporation. Apparatus for mixing gaseous fuel with air. 4,399,795, Cl. 123-527.000.
Brown, Paul J.; Dugan, Robert J.; and Guyette, Richard R., to International Business Machines Corp. Independent handling of I/O interrupt requests and associated status information transfers. 4,400,773, Cl. 364-200.000.
Brown, Richard, to Smiths Industries Public Limited Company. Testing display systems. 4,400,731, Cl. 358-139.000.
Brown, Richard E.; St. Georgiev, Vassil; Kropp, Philip; and Loev, Bernard, to USV Pharmaceutical Corporation. Thiazoloquinoxalin-1,4-diones for treating allergy. 4,400,382, Cl. 424-250.000.
Brown, Ronald E.; Edison, Lamonte R.; and Higdon, William D., to General Motors Corporation. Semiconductor pressure sensor with slanted resistors. 4,400,681, Cl. 338-4.000.
Broyles, Douglas W.; and Palmer, Ronald S., to International Memories, Inc. Method and apparatus for direct memory access in a data processing system. 4,400,772, Cl. 364-200.000.
Brucken, Byron L., to General Motors Corporation. Combination switch and valve device. 4,400,601, Cl. 200-81.400.
Bruder, Alan H., to Polaroid Corporation. Laminar electrical cells and batteries. 4,400,452, Cl. 429-152.000.
Bruder, Frank J.; and Taylor, Robert D., to EECO Incorporated. Axial cam rotary switch. 4,400,597, Cl. 200-6.00B.
Bruns, Ludwig: *See*—
Alter, Eduard; Bruns, Ludwig; and Volprecht, Werner, 4,400,308, Cl. 252-463.000.
Bruynes, Cornelis A.; and Jurriens, Theodorus K., to Gist-Brocades N.V. Silylation process. 4,400,509, Cl. 544-315.000.
Bschorr, Oskar, to Messerschmitt-Boelkow-Blohm Gesellschaft mit beschraenkter Haftung. Wheel tire with noise absorbing means. 4,399,851, Cl. 152-156.000.
Buchel, Karl H.: *See*—
Timmler, Helmut; Buchel, Karl H.; Brandes, Wilhelm; Frohberger, Paul-Ernst; and Scheinpflug, Hans, 4,400,388, Cl. 424-269.000.
Buchmann, Kurt; Eigen, Heinrich; and Reiter, Norbert, to Fried. Krupp Gesellschaft mit beschrankter Haftung. Cutting tool with adjustable chip breaker. 4,400,116, Cl. 407-3.000.
Buckley, Bruce S.; and Guldman, Thomas A. R., to Chevron Research Company. Method and apparatus for overtemperature control of solar water heating system. 4,399,807, Cl. 126-418.000.
Buckshaw, Thomas M., to Robertshaw Controls Company. Method of making a responsive control device. 4,399,606, Cl. 29-602.00R.
Budd Company, The: *See*—
Krull, Joseph A.; and Pavlick, Michael J., 4,400,121, Cl. 410-64.000.
Buechel, Frederick F.; Pappas, Michael J.; and Witte, Paul A., to Biomedical Engineering Corp. Adjustable surgical suction apparatus. 4,400,168, Cl. 604-48.000.
Buhler-Miag GmbH: *See*—
Stache, Bernd; and Vogt, Dieter, 4,400,268, Cl. 209-236.000.
Bunker, Nathan S.: *See*—
Wong, Rayman Y.; and Bunker, Nathan S., 4,400,330, Cl. 260-502.50F.
Bupp, James R.; and Maier, Lawrence R., to International Business Machines Corporation. Method of detecting and analyzing damage in printed circuit boards. 4,400,618, Cl. 250-302.000.
Burndy Corporation: *See*—
Sacks, Norman M., 4,400,048, Cl. 339-46.000.
Burroughs Corporation: *See*—
Koos, Larry W., 4,400,794, Cl. 364-900.000.
O'Brien, Thomas M., 4,399,750, Cl. 101-245.000.
Shapiro, Ira P., 4,400,818, Cl. 377-54.000.
Tomlinson, Christopher J., 4,400,768, Cl. 364-200.000.

Burroughs Wellcome Co.: *See*—
Davidson, Jonathan R. T.; and Dren, Anthony T., 4,400,383, Cl. 424-250.000.
Burton, Robert: *See*—
Kribs, David E.; and Burton, Robert, 4,400,763, Cl. 362-103.000.
Bush, Rodney D., to Procter & Gamble Company, The. 4-Vinyl-2-methylene butanedioic acid compounds. 4,400,531, Cl. 560-201.000.
Butler, David V.: *See*—
Orlowski, Jan A.; Butler, David V.; and Kidd, Patrick D., 4,400,159, Cl. 433-202.000.
Butler, George B.; Hogen-Esch, Thieo E.; Meister, John J.; and Pledger, Huey, Jr., to University of Florida. Water-soluble graft copolymers of starch-acrylamide and uses therefor. 4,400,496, Cl. 527-312.000.
Butler, James R.; Forward, Cleve H.; and Robison, Thomas W., to Cosden Technology, Inc. Ethylbenzene production employing tea-silicate catalysts. 4,400,570, Cl. 585-467.000.
Buxbaum, Gunter; Pflugmacher, Ingo; Hund, Franz; Hahnkamm, Volker; and Woditsch, Peter, to Bayer Aktiengesellschaft. Coating iron oxide particles for magnetic recording. 4,400,432, Cl. 428-403.000.
Byers, Edward R. Mounting and precision drive system for astronomical telescope, and the like. 4,400,066, Cl. 350-568.000.
C. A. Weidmuller GmbH: *See*—
Stenz, Paul P., 4,400,051, Cl. 339-217.00S.
C. Eugen Maier Metallverarbeitung GmbH: *See*—
Gallina, Kurt, 4,399,649, Cl. 57-115.000.
C I Designs, Inc.: *See*—
Emery, Francis, 4,399,754, Cl. 108-159.000.
C.M.L. Costruzioni Meccaniche Lonatesi, S.p.A.: *See*—
Canziani, Francesco, 4,399,904, Cl. 198-365.000.
Cadee, Theodorus P. M., to Van Doorne's Transmissie B.V. Method and apparatus for controlling an infinitely variable transmission. 4,400,164, Cl. 474-12.000.
Caldwell, Kenneth B., to Associated Engineering Limited. Automatic speed control systems. 4,400,757, Cl. 361-236.000.
Callaway, Milton A., to Simmons U.S.A. Corporation. Flotation mattress incorporating drain/fill valve. 4,399,576, Cl. 5-451.000.
Camezon, Raymond E.: *See*—
Beauvais, Max P.; and Camezon, Raymond E., 4,400,401, Cl. 426-234.000.
Camsco, Inc.: *See*—
Brown, Henry C.; and Mueller, Fredrick N., 4,400,704, Cl. 346-29.000.
Candlin, John P.; Caunt, Anthony D.; and Williams, Ian G., to Imperial Chemical Industries PLC. Transition metal compound. 4,400,301, Cl. 252-429.00B.
Cannella, Vincent D.: *See*—
Izu, Masatsugu; Cannella, Vincent D.; and Ovshinsky, Stanford R., 4,400,409, Cl. 427-39.000.
Canon Kabushiki Kaisha: *See*—
Ikemori, Keiji; and Tajima, Akira, 4,400,064, Cl. 350-426.000.
Miura, Yuzo; Katsuma, Makoto; and Suzuki, Masayuki, 4,400,076, Cl. 354-202.000.
Suzuki, Ryoichi; and Uchiyama, Takashi, 4,400,072, Cl. 354-43.000.
Takimoto, Hiroyuki; and Ushiro, Tatsuzo, 4,400,743, Cl. 358-335.000.
Tamura, Shuichi; Suzuki, Toyotosi; Tamamura, Hideo; and Matsuda, Mutsuhide, 4,400,071, Cl. 354-25.000.
Tosaka, Yoichi; Uchidoi, Masanori; Shigeta, Yoshihiro; Yoshikawa, Ryoichi; and Haraguchi, Shosuke, 4,400,073, Cl. 354-173.000.
Canziani, Francesco, to C.M.L. Costruzioni Meccaniche Lonatesi, S.p.A. Sorting and/or conveying system and relevant working plants. 4,399,904, Cl. 198-365.000.
Carcasona-Beltran, Alfonso: *See*—
Madaus, Rolf; Stumpf, Werner; Gorler, Klaus; and Carcasona-Beltran, Alfonso, 4,400,535, Cl. 562-584.000.
Cardarelli, Nathan F., to Environmental Chemicals, Inc. Controlled release of compounds utilizing a plastic matrix. 4,400,374, Cl. 424-78.000.
Carl Still GmbH & Co. KG, Firma: *See*—
Abendroth, Werner, 4,400,240, Cl. 202-248.000.
Carlson, Charles E., to Allied Corporation. Casting gap control system. 4,399,861, Cl. 164-453.000.
Carpenter, Dennis O.; and Ceola, Robert E., to Boeing Company, The. Magnetic heading simulator. 4,400,789, Cl. 364-578.000.
Carr, Neil; Gray, George W.; and Kelly, Stephen M., to Government of the UK., Her Majesty's. Liquid crystal ester compounds exhibiting a low or negative dielectric anisotropy and liquid crystal materials and devices incorporating such compounds. 4,400,061, Cl. 350-350.000.
Carrier Corporation: *See*—
Hesler, Benjamin F., 4,399,663, Cl. 62-193.000.
Hile, James R., 4,399,862, Cl. 165-2.000.
Jacobs, John J., 4,399,669, Cl. 62-469.000.
Ohlson, Harry E., Jr., 4,400,142, Cl. 417-372.000.
Cars and Concepts, Inc.: *See*—
Draper, David L.; and McKee, Gerald D., 4,399,600, Cl. 29-401.100.
Cascade Steel Rolling Mills, Inc.: *See*—
Robare, Arthur P., 4,400,816, Cl. 373-104.000.
Casey, Robert F. Procedures for raising fish. 4,399,769, Cl. 119-3.000.
Castel, Yvon; and Iato, Michel, to Societe Nationale Elf Aquitaine (Production). Connecting and disconnecting device for a guide line. 4,400,112, Cl. 405-224.000.
Catalytic Generators, Inc.: *See*—
Freebairn, Hugh T.; and Towns, Tony L., 4,400,291, Cl. 252-188.30R.
Caunt, Anthony D.: *See*—
Candlin, John P.; Caunt, Anthony D.; and Williams, Ian G., 4,400,301, Cl. 252-429.00B.
Cavanagh, Mark S., to Jacobs Manufacturing Company, The. Engine retarder hydraulic reset mechanism. 4,399,787, Cl. 123-321.000.
Cave, David L.; Maulding, Gary L.; and Weber, Howard F., to Motorola, Inc. Inductive load driver protection circuits having minimal power dissipation. 4,400,756, Cl. 361-152.000.
Centre Electronique Horloger SA: *See*—
Piquet, Christian; and Martin, Jean-Claude, 4,400,092, Cl. 368-82.000.
Centrone, Gerald V.: *See*—
Boggi, John J.; Centrone, Gerald V.; Dolin, Aaron M.; and Sherman, Ira N., 4,400,825, Cl. 378-150.000.
Centronics Data Computer Corp.: *See*—
Shiurila, John; and Williams, Richard A., 4,400,102, Cl. 400-124.000.
Ceola, Robert E.: *See*—
Carpenter, Dennis O.; and Ceola, Robert E., 4,400,789, Cl. 364-578.000.
Chabrolle, Jacques, to LCC-CICE Compagnie Europeene de Composants Electroniques. Magneto-electric transducer for a magnetic recording system and recording system comprising such a transducer. 4,400,752, Cl. 360-112.000.
Chadwick, David H.; and Boyd, Thomas E., to Mobay Chemical Corporation. Fixed bed catalyst for MNB and DNT hydrogenation. 4,400,538, Cl. 564-423.000.
Chaiko, Walter M.; and Larson, John A., to Ingersol-Rand Company. Friction rock stabilizer and a method of isolating the same from a bore surface. 4,400,113, Cl. 405-261.000.
Chambers, Ramon P.; and Mosley, William H., Jr., to E-Systems, Inc. Transversal correlator. 4,400,790, Cl. 364-604.000.
Champion International Corporation: *See*—
Sorenson, John F., 4,399,915, Cl. 206-586.000.
Chan, Chei P.: *See*—
Chen, Chang C.; and Chan, Chei P., 4,400,678, Cl. 337-195.000.
Chan, Shiu K.; Gerardi, John A.; and McGilvray, Bruce L., to International Business Machines Corporation. Cache synonym detection and handling means. 4,400,770, Cl. 364-200.000.
Chand, Ramesh, to GC Industries. Gas emitting device. 4,399,942, Cl. 239-34.000.
Chandross, Edwin A.; Reichmanis, Elsa; and Wilkins, Cletus W., Jr., to Bell Telephone Laboratories, Incorporated. Process of making semiconductor devices using photosensitive bodies. 4,400,461, Cl. 430-311.000.
Charlies Rental: *See*—
Bentley, Norman P., 4,399,869, Cl. 166-311.000.
Chatzipetros, Johann: *See*—
Bechthold, Paul S.; and Chatzipetros, Johann, 4,399,689, Cl. 73-24.000.
Cheavens, Thomas: *See*—
Braithwaite, David G.; Cheavens, Thomas; and Voyce, Jason M., 4,400,241, Cl. 203-18.000.
Chekroun, Rene: *See*—
Bens, Jean; Bloch, Marcel; Chekroun, Rene; and Klausz, Remy, 4,400,819, Cl. 378-20.000.
Chemap AG: *See*—
Muller, Hans, 4,400,399, Cl. 426-1.000.
Chemische Werke Huls AG: *See*—
Muller, Wolfgang H. E.; and Hofmann, Peter, 4,400,300, Cl. 252-414.000.
Chen, Chang C.; and Chan, Chei P. Fuse switch box. 4,400,678, Cl. 337-195.000.
Chen, Feng I.: *See*—
Wessels, John A.; and Chen, Feng I., 4,400,698, Cl. 340-825.720.
Chen, Hsing-Yao, to RCA Corporation. Color picture tube having an improved expanded focus lens type inline electron gun. 4,400,649, Cl. 313-414.000.
Cheng, Julian, to Bell Telephone Laboratories, Incorporated. Cell isolation in bistable nematic liquid crystal cells. 4,400,060, Cl. 350-339.00R.
Chervenak, Michael C.: *See*—
Kydd, Paul H.; Chervenak, Michael C.; and DeVaux, George R., 4,400,263, Cl. 208-10.000.
Chestnut, Benjamin F., to Emhart Industries, Inc. Control system. 4,400,685, Cl. 338-172.000.
Chevillat, Pierre R.; and Gfeller, Fritz, to International Business Machines Corporation. Document card containing information in holographic form. 4,400,616, Cl. 235-487.000.
Chevron Research Company: *See*—
Anderson, Glenn W.; and Hutchison, Stanley O., 4,399,865, Cl. 166-191.000.
Buckley, Bruce S.; and Guldman, Thomas A. R., 4,399,807, Cl. 126-418.000.
Ellis, J. R. B.; and Fries, Bernard A., 4,400,314, Cl. 252-633.000.
Jensen, Harbo P., 4,400,125, Cl. 414-187.000.
McConaughy, Robert C.; and Wright, Joe W., 4,399,872, Cl. 166-341.000.
Chew, Ju-Nam, to Mobil Oil Corporation. Coal comminution and recovery process using gas drying. 4,400,034, Cl. 299-5.000.
Chiba, Toshiyuki: *See*—
Takaya, Takao; Takasugi, Hisashi; Tsuji, Kiyoshi; and Chiba, Toshiyuki, 4,400,379, Cl. 424-246.000.

Chicago Pneumatic Tool Company: *See*—
Wallace, William K.; Giardino, David A.; and Groshans, Joseph R., 4,400,785, Cl. 364-508.000.

Chicago Roller Skate Company: *See*—
Ware, Gordon K., 4,400,001, Cl. 280-11.280.

Child, Edward T.: *See*—
Marion, Charles P.; Brent, Albert; Richter, George N.; Crouch, William B.; Child, Edward T.; and Reynolds, Blake, 4,400,179, Cl. 48-86.00R.
Marion, Charles P.; Crouch, William B.; Brent, Albert; Richter, George N.; Child, Edward T.; and Reynolds, Blake, 4,400,180, Cl. 48-197.00R.

Chin, Hsiao-Ling M., to Stauffer Chemical Company. Substituted amino carboxyethyl haloacetamide herbicide antidotes. 4,400,203, Cl. 71-100.000.

Chin, Hsiao-Ling M., to Stauffer Chemical Company. Herbicide antidote compositions and method of use. 4,400,529, Cl. 560-16.000.

Chivikin, Valery K.: *See*—
Shevakin, Jury F.; Seidaliev, Fikrat; S.; Tjushevsky, Vladimir M.; Krasovsky, Jury V.; Glebova, Erika D.; and Chivikin, Valery K., 4,400,605, Cl. 219-61.000.

Chloride Group Limited: *See*—
May, Geoffrey J., 4,399,607, Cl. 29-623.500.

Cho, Frederick Y.; and Williams, Dylan F., to Motorola Inc. Temperature stable cuts of quartz. 4,400,640, Cl. 310-313.00A.

Chopp, Joseph A., Jr.; and Mohr, Larry S., to Panduit Corp. Metal tie. 4,399,592, Cl. 24-25.000.

Christensen, Burton G.; Ratcliffe, Ronald W.; and Salzmann, Thomas N., to Merck & Co., Inc. 3-[1-Hydroxyethyl]-4-carboxymethyl-azetidin-2-one. 4,400,323, Cl. 260-239.00A.

Christy, James S.: *See*—
Evans, Hugh G.; Speer, Stephen; Christy, James S.; and Lafrenz, Stanley S., 4,399,665, Cl. 62-239.000.

Chromalloy American Corporation: *See*—
Schaaf, Wayne J.; and Boswell, Bennie J., 4,399,875, Cl. 172-311.000.

Chszaniecki, Siegfried; and Brand, Wilhelm, to Hermann Berstorff Maschinenbau GmbH. Twin screw extruder with power branching gearing. 4,399,719, Cl. 74-410.000.

Chulay, Steven J.; and Crotty, Daniel G., to Beckman Instruments, Inc. Top loading centrifuge rotor. 4,400,166, Cl. 494-20.000.

Chyron Corporation: *See*—
Currie, Glenn E.; and Fremed, Erika, 4,400,697, Cl. 340-711.000.

Ciba-Geigy Corporation: *See*—
Batzer, Hans; and Sinnreich, Joel, 4,400,296, Cl. 252-364.000.
Demmer, Christopher G.; Francombe, Roger; Garnish, Edward W.; and Massy, Derek J. R., 4,400,229, Cl. 156-307.500.
Hari, Stefan; and Wick, Arnold, 4,400,319, Cl. 260-155.000.
Pissiotas, Georg; and Rohr, Otto, 4,400,205, Cl. 71-105.000.
von der Crone, Jost, 4,400,507, Cl. 544-300.000.

Cielo, Paolo G., to Her Majesty the Queen as represented by the Minister of National Defence of her Majesty's Canadian Government. Evanescent-wave fiber reflector. 4,400,056, Cl. 350-96.190.

CII Honeywell Bull: *See*—
Lequien, Jean, 4,400,746, Cl. 360-77.000.

Claassen, Peter: *See*—
List, Helmut; Claassen, Peter; and Zeiringer, Rudolf, 4,399,706, Cl. 73-708.000

Clark, L. Dale; and Archambeault, William J., to Santa Barbara Research Center. Laser drive circuits. 4,400,812, Cl. 372-29.000.

Clark, Roger T.; and Gardner, David M., to Pennwalt Corporation. Catalyst pellets with resin binder for decomposition of hypochlorite. 4,400,304, Cl. 252-430.000.

Clarke, Robert S., to Lucas Industries Limited. Suspension unit for a power tool. 4,400,023, Cl. 285-302.000.

Clement, Burke. Twist drill. 4,400,119, Cl. 408-230.000.

Clements, Stanley, to Ben Clements & Sons, Inc. Tag pin devices. 4,399,918, Cl. 211-113.000.

Close, Donald, to David Hudson, Inc. Novel fluoroelastomer film compositions containing silane compounds and method for the preparation thereof. 4,400,482, Cl. 524-114.000.

Closson, Thomas A.; Oxford, David B.; Schenck, Stephen R.; and Seitchik, Jerold A., to Texas Instruments Incorporated. Temperature compensated sense amplifier. 4,400,796, Cl. 365-8.000.

Clunie, James S.: *See*—
Dhanani, Shafiq; MacDonald, Ronald; Clunie, James S.; and Brooks, Maxim C., 4,400,288, Cl. 252-135.000.

Coale Juip (Proprietary) Limited: *See*—
Minnaar, Daniel; and Straughan, Clive, 4,400,122, Cl. 411-67.000.

Coates, Clarence A., Jr.: *See*—
Weaver, Max A.; and Coates, Clarence A., Jr., 4,400,318, Cl. 260-152.000.

Cobb, Carleton M., III; Morin, Roland G.; and Hirsbrunner, Hans G., to Texas Instruments Incorporated. Fail safe circuit breaker. 4,400,677, Cl. 337-6.000.

Coca-Cola Company, The: *See*—
Richter, Simon J.; and Sanscharowskiy, Michael, 4,399,916, Cl. 209-559.000.

Coe, E. Lee, Jr., to Wahlco, Inc. Method and apparatus for energizing an electrostatic precipitator. 4,400,662, Cl. 323-320.000.

Coenen, Hubert; Hagen, Rainer; and Knuth, Manfred, to Fried. Krupp Gesellschaft mit beschrankter Haftung. Method for obtaining aromatics and dyestuffs from bell peppers. 4,400,398, Cl. 426-429.000.

Coffman, Roy E.: *See*—
Lane, Arlo E., 4,400,187, Cl. 55-387.000.

Cohen, Barry J.; Scaramuzza, Joseph; and Tock, Graham, to Peabody Holmes Limited. Fluid injector. 4,399,943, Cl. 239-125.000.

Coin Acceptors, Inc.: *See*—
Holland, Charles R.; and Vogt, Carl L., 4,399,902, Cl. 194-1.00D.

Colamco, Inc.: *See*—
Smith, Thomas L., 4,400,422, Cl. 428-160.000.

Cole, Howard W., Jr. Suppression of respirable dust with foam. 4,400,220, Cl. 134-18.000.

Cole, Rossa W.; and Leto, Anthony, to Curtiss-Wright Corporation. Low BTU gas combustor. 4,399,652, Cl. 60-39.465.

Collins, Carter. Apparatus for analyzing and identifying odorants. 4,399,687, Cl. 73-23.000.

Collins, William J. Device for sampling molten material and means for operating same. 4,399,713, Cl. 73-864.540.

Collins, William J. Device for plugging a taphole in a furnace. 4,399,986, Cl. 266-272.000.

Colon, Ismael, to Union Carbide Corporation. Integrated process for the preparation of substantially linear high molecular weight thermoplastic polymers from aryl polyhalide monomers. 4,400,499, Cl. 528-174.000.

Colon, Ismael, to Union Carbide Corporation. Reduction of organic halides. 4,400,566, Cl. 585-359.000.

Colorado Video Incorporated: *See*—
Southworth, Glen R.; McClelland, Larry R.; and Johnson, Bruce F., 4,400,717, Cl. 358-13.000.

Colvern Limited: *See*—
Pitcher, Arnold, 4,400,686, Cl. 338-184.000.

Combustion Engineering, Inc.: *See*—
Prestridge, Floyd L.; Schuetz, Adolph A.; and Wheeler, Harry L, 4,400,253, Cl. 204-186.000.

Commissariat a l'Energie Atomique: *See*—
Biancale, Pierre; Corfa, Yves-Paul; Lemercier, Pierre; Moreau, Jean-Pierre; and Vertut, Jean, 4,400,115, Cl. 405-303.000.
Pierart, Robert; and Moutard, Daniel, 4,400,345, Cl. 376-292.000.

Commissariat a l'Engergie Atomique & Socitet Brachier et Fils: *See*—
Abbes, Claude; Rouaud, Christian; Forges, Robert; and de Villepoix, Raymond, 4,400,018, Cl. 285-31.000.

Compagnie Generale de Radiologie: *See*—
Bens, Jean; Bloch, Marcel; Chekroun, Rene; and Klausz, Remy, 4,400,819, Cl. 378-20.000.

Compagnie Industrielle des Telecommunications Cit-Alcatel: *See*—
de Kermadec, Alain; and Delanoe, Christian, 4,400,709, Cl. 346-154.000.

Compagnie Internationale pour l'Informatique CII-Honeywell Bull: *See*—
Dupont, Jean, 4,399,958, Cl. 242-182.000.

Compugraphic Corporation: *See*—
St. Pierre, Alfred J.; Darnstaedt, Dann; and Blake, Laurence S., 4,400,069, Cl. 354-11.000.

Condas, George A.; and Doss, Saad K., to International Business Machines Corporation. Process for applying barrier layer anodic coatings. 4,400,246, Cl. 204-58.000.

Connick, William J., Jr., to United States of America, Agriculture. Controlled release of bioactive materialt using alginate gel beads. 4,400,391, Cl. 424-304.000.

Conrad, James R. Remote driving tool with tubular lock feature. 4,400,028, Cl. 294-19.00R.

Contato, Ugo, to Fiat Auto S.p.A. Support group for mounting instrument and electrical components in a motor vehicle. 4,399,888, Cl. 180-315.000.

Continental Alloys S.A.: *See*—
Tanson, Aloyse, 4,400,207, Cl. 75-129.000.

Continental Group, Inc., The: *See*—
Gerenser, Robert J.; and Littauer, Ernest L., 4,400,447, Cl. 429-27.000.

Cooke, Theodore M.; Lin, Robert A.; Whitfield, Richard G.; and Hock, Allan G., to Exxon Research and Engineering Co. Ink jet ink formulation for reduced start-up problems. 4,400,215, Cl. 106-22.000.

Cookson, Alan H.; and Dale, Steinar J. High voltage gas insulated transmission line with continuous particle trapping. 4,400,578, Cl. 174-14.00R.

Cooper, Patrick R.: *See*—
Vivian, John; Cooper, Patrick R.; Higgins, Ronald B.; Harlan, John A.; Perry, Paul M.; Vallhonrat, Juan B.; and Golden, Donald P., Jr., 4,400,778, Cl. 364-200.000.

Copperthwaite, Martin; and Roberts, Michael A., to USS Engineers & Consultants, Inc. Basic refractory cementitious material and components thereof. 4,400,474, Cl. 501-119.000.

Coquin, Gerald A.; Moran, Joseph M.; and Taylor, Gary N., to Bell Telephone Laboratories, Incorporated. Etching apparatus and method. 4,400,235, Cl. 156-643.000.

Corfa, Yves-Paul: *See*—
Biancale, Pierre; Corfa, Yves-Paul; Lemercier, Pierre; Moreau, Jean-Pierre; and Vertut, Jean, 4,400,115, Cl. 405-303.000.

Cormier, Thomas E.: *See*—
Patel, Suresh U.; Cormier, Thomas E.; and Wilson, Keith B., 4,400,188, Cl. 62-13.000.

Cornell, William H.: *See*—
Siedenstrang, Roy W.; and Cornell, William H., 4,400,483, Cl. 524-247.000.

Corso, Anthony J., to American Hoechst Corporation. Method of forming copper complexes of azo-dyestuffs using non-salt-forming copper (II) compounds. 4,400,317, Cl. 260-151.000.

Cosden Technology, Inc.: *See*—
Abernathy, Marshall W., Jr.; and Jurgens, Kenneth C., Jr., 4,400,493, Cl. 526-68.000.

Butler, James R.; Forward, Cleve H.; and Robison, Thomas W., 4,400,570, Cl. 585-467.000.
Hunton, Thomas M., 4,400,569, Cl. 585-444.000.
Cottell, Eric C. Fuels and methods for their production. 4,400,177, Cl. 44-51.000.
Cottingham, Auburn B.: *See*—
Brima, Thomas S.; and Cottingham, Auburn B., 4,400,324, Cl. 260-369.000.
Cowdery, David, to Telectronics Pty. Ltd. Heart pacer mechanical construction. 4,399,819, Cl. 128-419.00P.
Craig, Laurence B.; and Farina, Alfred J. Combustion heating system. 4,400,152, Cl. 431-328.000.
Creed, Gerald J.; and Zylbert, Thaddeus J., to Singer Company, The. Resilient bobbin thread pull-off member for lockstitch sewing machine. 4,399,761, Cl. 112-242.000.
Crehan, Patrick James: *See*—
Kennedy, Richard B., 4,400,475, Cl. 521-103.000.
Cross, Raymond P.; and Simpkin, Gordon T., to Pilkington Brothers Limited. Method of thermal toughening of glass in a fluidized bed. 4,400,193, Cl. 65-114.000.
Crotty, Daniel G.: *See*—
Chulay, Steven J.; and Crotty, Daniel G., 4,400,166, Cl. 494-20.000.
Crouch, William B.: *See*—
Marion, Charles P.; Brent, Albert; Richter, George N.; Crouch, William B.; Child, Edward T.; and Reynolds, Blake, 4,400,179, Cl. 48-86.00R.
Marion, Charles P.; Crouch, William B.; Brent, Albert; Richter, George N.; Child, Edward T.; and Reynolds, Blake, 4,400,180, Cl. 48-197.00R.
Crudden, Eric H.; and Jessen, P. Jay, to Boeing Company, The. Power opening system for engine cowl doors. 4,399,966, Cl. 244-129.400.
Cruz, Mamerto M., Jr., to Morca, Inc. Modified hydrated magnesium aluminosiiicates and method of preparation. 4,400,297, Cl. 252-378.00R.
Cucelli, Andrea; Brizzolesi, Gustavo; and Bossi, Emilio, to S.A.G.A. Societa' Applicazioni Gomma Antivibranti S.p.A. Resilient support device. 4,399,987, Cl. 267-140.100.
Culmo, Robert F., to Perkin-Elmer Corporation, The. Apparatus useful for analyzing refractory substances. 4,400,354, Cl. 422-78.000.
Cuppett, Darrell J., to Towle Manufacturing Company. Cork puller. 4,399,720, Cl. 81-3.370.
Currie, Glenn E.; and Fremed, Erika, to Chyron Corporation. Method of line buffer loading for a symbol generator. 4,400,697, Cl. 340-711.000.
Curtiss, William P.; and Sharp, Gordon P., to IMEC Corporation. Self generative variable speed induction motor drive. 4,400,655, Cl. 318-729.000.
Curtiss-Wright Corporation: *See*—
Cole, Rossa W.; and Leto, Anthony, 4,399,652, Cl. 60-39.465.
Czerney, Peter: *See*—
Walkow, Fred; Czerney, Peter; Hartmann, Horst; and Marx, Jorg, 4,400,458, Cl. 430-157.000.
Daikin Kogyo Co., Ltd.: *See*—
Ohsaka, Yohnosuke; Hiramatsu, Uji; and Honda, Toshihide, 4,400,563, Cl. 570-144.000.
Daimler-Benz Aktiengesellschaft: *See*—
Weiger, Gunter; Schwerdt, Paul; and Ziegenberg, Alfred, 4,399,705, Cl. 73-654.000.
Dainippon Screen Seizo Kabushiki Kaisha: *See*—
Yonekura, Yasuhiro, 4,400,617, Cl. 250-214.00A.
Dale, Steinar J.: *See*—
Cookson, Alan H.; and Dale, Steinar J., 4,400,578, Cl. 174-14.00R.
Damratowski, Haroid; and Jenson, Jerry, to Triad Corporation. Pilfer resistant container. 4,399,914, Cl. 206-533.000.
Dancsi, Lajos: *See*—
Szantay, Csaba; Szabo, Lajos; Kalaus, Gyorgy; Dancsi, Lajos; Keve, Tibor; Drexler, Ferenc; and Mihalyfi, Krisztina, 4,400,514, Cl. 546-51.000.
Dango & Dienenthal Maschinenbau GmbH: *See*—
Schneider, Werner, 4,399,710, Cl. 73-863.830.
Daniel, Michael R.; Adam, John D.; and Moore, Robert A., to United States of America, Air Force. Magnetostatic wave delay line having improved group delay linearity. 4,400,669, Cl. 333-141.000.
Danzel, Horst: *See*—
Geldner, Joachim; Rones, Josef; and Danzel, Horst, 4,400,289, Cl. 252-142.000.
Darden, Jerome W.; Marquis, Edward T.; and Watts, Lewis W., Jr., to Texaco Inc. Co-catalyst for use with boron trifluoride in olefin oligomerization. 4,400,565, Cl. 585-10.000.
Darga, August J. Removable gate. 4,399,635, Cl. 49-57.000.
Darnstaedt, Dann: *See*—
St. Pierre, Alfred J.; Darnstaedt, Dann; and Blake, Laurence S., 4,400,069, Cl. 354-11.000.
Dash, Somanath; Garnache, Richard R.; and Troutman, Ronald R., to International Business Machines Corporation. Method of making dense complementary transistors. 4,399,605, Cl. 29-571.000.
Dassler, Armin A., to PUMA-Sportschuhfabriken Rudolf Dassler KG. Athletic shoe, especially tennis shoe. 4,399,621, Cl. 36-32.00R.
Daudt, William H.; Frye, Cecil L.; and Hyde, James F., to Dow Corning Corporation. Aqueous metal ammine siliconate solutions, and amorphous materials derived therefrom, and methods of their use. 4,400,326, Cl. 260-429.00R.
Daughters, James R., to Wordex. Universal ribbon cartridge. 4,400,103, Cl. 400-208.000.
David, Constant V. Power plant having a free piston combustion member. 4,399,654, Cl. 60-595.000.
David Hudson, Inc.: *See*—
Close, Donald, 4,400,482, Cl. 524-114.000.
Davidson, Ian H., to Air-Shields, Inc. Apparatus for detecting probe dislodgement. 4,399,824, Cl. 128-736.000.
Davidson, John J.: *See*—
Heffner, Robert E.; and Davidson, John J., 4,400,251, Cl. 204-181.00R.
Davidson, Jonathan R. T.; and Dren, Anthony T., to Burroughs Wellcome Co. Treatment of anxiety. 4,400,383, Cl. 424-250.000.
Davies, Haydn S.; Garstang, James H.; and Timmins, Cyril, to British Gas Corporation. Vaporization and gasification of hydrocarbon feedstocks. 4,400,182, Cl. 48-214.00A.
Davis, Leo L. Saw workpiece pushing device. 4,399,728, Cl. 83-418.000.
Davy, Lee N., to Eastman Kodak Company. Column defect compensating apparatus for CCD image sensor. 4,400,734, Cl. 358-163.000.
Dawes, John L.; and Devon, Thomas J., to Eastman Kodak Company. Hydroformylation process utilizing an unmodified rhodium catalyst and the stabilization and regeneration thereof. 4,400,547, Cl. 568-454.000.
de la Haye, Cornelis F., to Technic Design One N.V. Demountable bicycle frame. 4,400,003, Cl. 280-278.000.
Dean, Raymond H., to Tempmaster Corporation. Noise attenuating apparatus for modulating air flow. 4,399,739, Cl. 98-41.00R.
Dearth, James D., to Atlantic Richfield Company. Method for controlling the flow of subterranean water into a selected zone in a permeable subterranean carbonaceous deposit. 4,399,866, Cl. 166-245.000.
DeBoersap, Herman: *See*—
Maruzzo, Walter F.; and DeBoersap, Herman, 4,400,030, Cl. 297-219.000.
De Bradandere, Joan; and VanMeenen, Freddy. Hose clamp with wedged lock. 4,399,593, Cl. 24-25.000.
Decision Data Computer Corporation: *See*—
Beisty, James M.; Miller, Robert J.; and Romeo, Albert J., 4,400,083, Cl. 355-16.000.
DeDecker, Edward J., to Virco Mfg. Corporation. Interlocking chair. 4,400,031, Cl. 297-239.000.
Deere & Company: *See*—
Behlmer, Wilbur D., 4,399,896, Cl. 192-13.00R.
Hauser, Herbert J., Jr., 4,399,783, Cl. 123-193.0CH.
O'Neill, Michael J.; Brautigam, Peter F.; and Stricker, David K., 4,399,882, Cl. 180-6.480.
Poore, Bernard B.; and May, Charles W., 4,399,793, Cl. 123-502.000.
Stillmunkes, Dean J., 4,400,002, Cl. 280-164.00A.
Viaud, Jean, 4,399,746, Cl. 100-88.000.
De Felice, Stephen L., to Biocarn Ltd. Carnitine and its use in reducing cardiac toxicity and as a synergist with cytostats. 4,400,371, Cl. 424-10.000.
Degussa Aktiengesellschaft: *See*—
Kruger, Horst; Berndt, Wilhelm; and Suss, Hans U., 4,400,237, Cl. 162-76.000.
Dehm, David C., to Atlantic Richfield Co. Yarn processing lubricants. 4,400,281, Cl. 252-8.600.
De Jonge, Adriaan: *See*—
Innemee, Hendricus C.; van Meel, Jacobus C. A.; De Jonge, Adriaan; Timmermans, Petrus B. M. W. M.; and van Zwieten, Pieter A., 4,400,378, Cl. 424-244.000.
de Kermadec, Alain; and Delanoe, Christian, to Compagnie Industrielle des Telecommunications Cit-Alcatel. Image printer stylus bar, manufacturing method therefor and image printer device. 4,400,709, Cl. 346-154.000.
Dekker, Lambert: *See*—
Klemarczyk, Philip T.; Dekker, Lambert; and Kiwala, Jacob, 4,400,311, Cl. 252-522.00R.
Del Mar Avionics: *See*—
Shu, Stephen K., 4,400,745, Cl. 360-73.000.
Delanoe, Christian: *See*—
de Kermadec, Alain; and Delanoe, Christian, 4,400,709, Cl. 346-154.000.
Delhey, Hans-Martin: *See*—
Braun, Albert; Portz, Willi; Strauss, Georg; and Delhey, Hans-Martin, 4,400,292, Cl. 252-189.000.
Deline, Richard R.; and Miner, William R., to Esco Corporation. Skidding grapple having winch-line capability. 4,400,132, Cl. 414-569.000.
Delpidio, Dominic J. Device for removing weeds. 4,400,029, Cl. 294-50.900.
Demmer, Christopher G.; Francombe, Roger; Garnish, Edward W.; and Massy, Derek J. R., to Ciba-Geigy Corporation. Process for the preparation of phenolic resin-containing dispersions and their use as adhesives. 4,400,229, Cl. 156-307.500.
DeMott, Roy P., to Milliken Research Corporation. Process for imparting soil resistance to polyester-fiber-containing textile materials. 4,400,414, Cl. 427-210.000.
Dennis, William H., to Phillips Phillips Petroleum. Air pollution detection. 4,399,688, Cl. 73-23.100.
Dennison Manufacturing Company: *See*—
Pitts, Warren R., 4,400,107, Cl. 402-4.000.
Dennison, Robert R. Leader-tying vise device. 4,400,025, Cl. 289-17.000.
den Otter, Gerrit J., to Shell Oil Company. Catalyst preparation. 4,400,576, Cl. 585-739.000.
De Paolis, Chiara: *See*—
Zetler, Gerhard; Rossi, Alessandro; and De Paolis, Chiara, 4,400,377, Cl. 424-177.000.

dePolo, Harry R. Eccentrically rotatable chair. 4,400,032, Cl. 297-349.000.

Derosier, Gregory S., to Trane Company, The. Heat pump water heater circuit. 4,399,664, Cl. 62-238.700.

De Shong, George T., to Du Pont de Nemours, E. I., and Company. Apparatus. 4,399,988, Cl. 269-8.000.

Design Dynamics Limited: *See*—
Maruzzo, Walter F.; and DeBoersap, Herman, 4,400,030, Cl. 297-219.000.

DeSoto, Inc.: *See*—
Minnis, Ralph L.; Ragas, Frank J.; and Beauchamp, Gerson E., 4,400,441, Cl. 428-514.000.

Desourdy, Bernard. Roadable storage container for bituminous mix. 4,400,126, Cl. 414-332.000.

De Souza Dias, Edson; Santos, Luiz D. D.; Teixeira, Joao C.; Amorin, Osvaldo; and Lamprecht, Antonio R. D. A., to Petroleo Brasileiro S.A. - Petrobras. Mechanism for granulometric distribution of solid particles. 4,399,846, Cl. 141-192.000.

de Souza, Noel J.: *See*—
Lal, Bansi; D'Sa, Adolf; Dornauer, Horst; and de Souza, Noel J., 4,400,506, Cl. 544-246.000.

Dettbarn, Hans-Jurgen; and Zimmermann, Josef, to Hoechst Aktiengesellschaft. Needle-less injection instrument. 4,400,171, Cl. 604-68.000.

Dettbarn, Hans-Jurgen; and Zimmermann, Josef, to Hoechst Aktiengesellschaft. Needle-less injection instrument. 4,400,172, Cl. 604-70.000.

Deutsche Babcock Aktiengesellschaft: *See*—
Lietzke, Heinz; and Mayr, Heribert K., 4,400,111, Cl. 405-196.000.

DeVaux, George R.: *See*—
Kydd, Paul H.; Chervenak, Michael C.; and DeVaux, George R., 4,400,263, Cl. 208-10.000.

de Versterre, William I.; and Worden, Donald A., to Marotta Scientific Controls, Inc. Self-contained closed-loop electrically operated valve. 4,399,836, Cl. 137-487.500.

de Villepoix, Raymond: *See*—
Abbes, Claude; Rouaud, Christian; Forges, Robert; and de Villepoix, Raymond, 4,400,018, Cl. 285-31.000.

Devon, Thomas J.: *See*—
Dawes, John L.; and Devon, Thomas J., 4,400,547, Cl. 568-454.000.

Deweerdt, Julien; Sala, Jacques; and Souyri, Denis, to Societe Nationale des Poudres et Explosifs. Process for the manufacture of thiochlorformates. 4,400,329, Cl. 260-455.00B.

Dhanani, Shafiq; MacDonald, Ronald; Clunie, James S.; and Brooks, Maxim C., to Procter & Gambie Company, The. Detergent compositions and processes of making thereof. 4,400,288, Cl. 252-135.000.

Dhein, Rolf; and Fleiter, Lothar, to Bayer Aktiengesellschaft. Aerially-crosslinking polyacrylate coating agents. 4,400,489, Cl. 525-301.500.

Diamond Shamrock Corporation: *See*—
Gordon, Arnold Z., 4,400,451, Cl. 429-111.000.

Diaz, Zaida, to Shell Oil Company. H_2S Removal process. 4,400,368, Cl. 423-573.00R.

Di Battista, Piero, to Montedison, S.p.A. 1-Oxa-6-azaspiro[2.5]octanes. 4,400,513, Cl. 546-16.000.

Diepold-Scharnitzky, Rudolf, to Siemens Aktiengesellschaft. Flow meter. 4,399,709, Cl. 73-861.770.

Diesel Kiki Co., Ltd.: *See*—
Hatsuno, Hiroshi, 4,399,681, Cl. 72-342.000.

DiPino, Michael A.: *See*—
Santoso, Muljadi; and DiPino, Michael A., 4,400,434, Cl. 428-421.000.

Director-General of the Agency of Industrial Science and Technology: *See*—
Takehira, Katsuomi; Ishikawa, Toshio; Hayakawa, Takashi; and Imamura, Juichi, 4,400,544, Cl. 568-360.000.

DiRocco, David J.: *See*—
DiRocco, Jobbie; and DiRocco, David J., 4,399,854, Cl. 152-367.000.

DiRocco, Jobbie; and DiRocco, David J. Tire repair patch and method of manufacture. 4,399,854, Cl. 152-367.000.

Dixit, Sunit S.; and Stansky, William V., Jr., to Richardson Graphics Company. Finisher and preserver for lithographic plates. 4,400,481, Cl. 524-55.000.

Dobias, Frank L., to Binks Manufacturing Company. Air washer particularly for paint spray booths. 4,399,742, Cl. 98-115.05SB.

Dr. Hans Heubach GmbH & Co. KG: *See*—
Haacke, Wigo; Adrian, Gerhard; Gawol, Manfred; Henbach, Rainer; and 37, 4,400,365, Cl. 423-306.000.

Dr. Johannes Heidenhain GmbH: *See*—
Nelle, Gunther, 4,400,651, Cl. 315-205.000.

Dr. Madaus & Co.: *See*—
Madaus, Rolf; Stumpf, Werner; Gorler, Klaus; and Carcasona-Beltran, Alfonso, 4,400,535, Cl. 562-584.000.

Doetsch, Werner; Honig, Helmut; and Siegel, Rudolf, to Peroxid-Chemie GmbH. Hydrogen peroxide adduct and process for preparation and use thereof. 4,400,367, Cl. 423-463.000.

Dolin, Aaron M.: *See*—
Boggi, John J.; Centrone, Gerald V.; Dolin, Aaron M.; and Sherman, Ira N., 4,400,825, Cl. 378-150.000.

Dombrowski, Theodor, to Wilhelm Hegenscheidt Gesellschaft mgH. Lathe machine for turning wheel sets, especially sets of railroad wheels. 4,399,724, Cl. 82-8.000.

Donnelly, Francis M., deceased; and by Donnelly, Marion Y., personal representative. Apparatus for desulfurizing combustion gases. 4,400,355, Cl. 422-170.000.

Donnelly, Marion Y., personal representative: *See*—
Donnelly, Francis M., deceased; and Donnelly, Marion Y., personal representative, 4,400,355, Cl. 422-170.000.

Donnelly, Michael M., to Air-Shields, Inc. Apparatus for detecting probe dislodgement. 4,399,823, Cl. 128-736.000.

Dornauer, Horst: *See*—
Lal, Bansi; D'Sa, Adolf; Dornauer, Horst; and de Souza, Noel J., 4,400,506, Cl. 544-246.000.

Dornier System GmbH: *See*—
Wahl, Klaus; and Purps, Klaus, 4,400,279, Cl. 210-679.000.

Doryokuro Kakunenryo Kaihatsu Jigyodan: *See*—
Ohtsuka, Katsuyuki; Miyo, Hiroaki; and Hayashi, Daisaku, 4,400,604, Cl. 219-10.55M.

Doss, Saad K.: *See*—
Condas, George A.; and Doss, Saad K., 4,400,246, Cl. 204-58.000.

Douthart, Richard J.; Kleinschmidt, Walter J.; and Schultz, Richard M., to Eli Lilly and Company. Tobramycin-double stranded RNA complex suitable for inducing interferon. 4,400,375, Cl. 424-85.000.

Dover Corporation: *See*—
Atkey, Richard E., 4,399,685, Cl. 73-11.000.

Dow Chemical Company, The: *See*—
Henslee, Walter W.; Lindsey, John S.; Morrow, Stanley J.; Periard, John N.; and Whitworth, Charles R., 4,400,431, Cl. 428-402.000.
Pawloski, Chester E., 4,400,516, Cl. 546-276.000.
Roberson, Keith; and Filter, Harold E., 4,400,313, Cl. 252-628.000.

Dow Corning Corporation: *See*—
Daudt, William H.; Frye, Cecil L.; and Hyde, James F., 4,400,326, Cl. 260-429.00R.

Draftex Development AG: *See*—
Bright, Robert G., 4,399,644, Cl. 52-716.000.

Dragerwerk Aktiengesellschaft: *See*—
Hans-Jurgen, Busack; Kaross, Klaus; and Rinne, Helmut, 4,400,258, Cl. 204-415.000.

Draper, David L.; and McKee, Gerald D., to Cars and Concepts, Inc. Vehicle door conversion. 4,399,600, Cl. 29-401.100.

Dren, Anthony T.: *See*—
Davidson, Jonathan R. T.; and Dren, Anthony T., 4,400,383, Cl. 424-250.000.

Drexler, Ferenc: *See*—
Szantay, Csaba; Szabo, Lajos; Kalaus, Gyorgy; Dancsi, Lajos; Keve, Tibor; Drexler, Ferenc; and Mihalyfi, Krisztina, 4,400,514, Cl. 546-51.000.

Dria, Dennis E.; and Bremer, Noel J., to Standard Oil Company, The. Process for the preparation of fluidizable catalysts. 4,400,306, Cl. 252-431.00R.

Dross, Joachim: *See*—
Reinehr, Ulrich; Herbertz, Toni; Jungverdorben, Hermann J.; and Dross, Joachim, 4,400,339, Cl. 264-206.000.

Drutchas, Gilbert H.; and Suttkus, David J., to TRW, Inc. Air compressor. 4,400,144, Cl. 417-415.000.

D'Sa, Adolf: *See*—
Lal, Bansi; D'Sa, Adolf; Dornauer, Horst; and de Souza, Noel J., 4,400,506, Cl. 544-246.000.

D'Silva, Themistocles D. J., to Union Carbide Corporation. Pesticidal symmetrical bis-sulfenylated-bis carbamate compounds. 4,400,389, Cl. 424-300.000.

Duff, Dean R.: *See*—
Beebe, William E.; and Duff, Dean R., 4,400,753, Cl. 360-133.000.

Duffield, Frederick R., to Frederick Duffield Pty. Limited. Reusable type hose end fitting. 4,400,021, Cl. 285-247.000.

Dugan, Robert J.: *See*—
Brown, Paul J.; Dugan, Robert J.; and Guyette, Richard R., 4,400,773, Cl. 364-200.000.

Duis, Arnoldus T. H., to Eldurail Industrie en Handelsonderneming B.V. Lifting device for driving a load. 4,400,656, Cl. 318-798.000.

Duley, Raymond S., to NCR Corporation. Voltage regulation and battery dissipation limiter circuit. 4,400,661, Cl. 323-275.000.

Dumas, Christ J.: *See*—
Simovits, Stephen J., Jr.; and Dumas, Christ J., 4,400,645, Cl. 313-325.000.

Dumas & Inchauspe: *See*—
Azoulay, Edgard E. Y., 4,400,466, Cl. 435-101.000.

Duncan, Charles P., to United States of America, Energy. Collecting apparatus. 4,399,629, Cl. 43-4.000.

Dunegan, Ronald G., to Rodun Development Corporation. Nut and thread protector. 4,400,123, Cl. 411-373.000.

Dunlop, John I., to Unisearch Limited. Method and means for detecting decay in wood. 4,399,701, Cl. 73-579.000.

Dunn, Charles S.; and Seng, Stephen, to Owens-Corning Fiberglas Corporation. Electrode aligning apparatus. 4,400,815, Cl. 373-92.000.

Dupont, Colyer L. Belt attached carrier. 4,399,934, Cl. 224-240.000.

Du Pont de Nemours, E. I., and Company: *See*—
De Shong, George T., 4,399,988, Cl. 269-8.000.
Fickes, Michael G.; and Rakoczy, Bohdan, 4,400,460, Cl. 430-306.000.
Gruetzmacher, Robert R.; Munger, Stanley H.; and Warfield, Peter F., 4,400,459, Cl. 430-306.000.
Nair, K. Manikantan, 4,400,310, Cl. 252-514.600.

Dupont, Jean, to Compagnie Internationale pour l'Informatique CII-Honeywell Bull. Tape loop position detector. 4,399,958, Cl. 242-182.000.

Dupressoir, Albert, to Thomson-CSF. Common antenna for primary and secondary radar. 4,400,701, Cl. 343-725.000.

Durand, William W.; and Peterson, Ronald E., to Honeywell Inc. Tunable Fabry-Perot filter. 4,400,058, Cl. 350-166.000.

Durenec, Peter; and Holt, Steven L., to United States of America, Army. Prolonged cold temperature cryogenic cooler. 4,399,661, Cl. 62-65.000.

Durr, Werner: *See*—
Kullik, Gunter R. J.; Durr, Werner; and Maier, Robert, 4,399,585, Cl. 15-319.000.

Durst (U.K.) Limited: *See*—
Long, John G., 4,400,084, Cl. 355-74.000.

Dworak, Wilhelm; Muller, Karl-Heinz; Mayer, Siegfried; Talmon, Wolfgang; and Grabow, Kurt, to Robert Bosch GmbH. Fluid-operated gear machine. 4,400,146, Cl. 418-131.000.

Dymax Corporation: *See*—
Matzuk, Terrance, 4,399,703, Cl. 73-621.000.

Dynamit Nobel Aktiengesellschaft: *See*—
aus der Funten, Helmut; and Schrage, Klaus, 4,400,533, Cl. 562-443.000.

Dziuba, Peter; and Simon, Herbert, to Zahnradfabrik Friedrichshafen AG. Power take-off. 4,399,715, Cl. 74-15.660.

E. R. Squibb & Sons, Inc.: *See*—
Neirinckx, Rudi D., 4,400,358, Cl. 423-2.000.

E-Systems, Inc.: *See*—
Chambers, Ramon P.; and Mosley, William H., Jr., 4,400,790, Cl. 364-604.000.

Eagle-Picher Industries, Inc.: *See*—
Ownby, Paul D.; and Grayson, Paul E., 4,400,232, Cl. 156-601.000.

Early, Judson H.: *See*—
Off, Joseph W. A.; and Early, Judson H., 4,400,165, Cl. 493-457.000.

Eastman Kodak Company: *See*—
Davy, Lee N., 4,400,734, Cl. 358-163.000.
Dawes, John L.; and Devon, Thomas J., 4,400,547, Cl. 568-454.000.
Maskasky, Joe E., 4,400,463, Cl. 430-434.000.
Weaver, Max A.; and Coates, Clarence A., Jr., 4,400,318, Cl. 260-152.000.

Eastwood, Owen, to Monoconstruction Limited. Metallurgical lance. 4,399,985, Cl. 266-265.000.

Ebdon, Leslie C.; and Hafferty, Brendan P. Monitoring of heavy metal ions, electrode therefor and method of making a membrane sensitive to heavy metal ions. 4,400,243, Cl. 204-1.00T.

Eberle, William J., to General Battery Corporation. Apparatus for removing temporary side terminals from batteries. 4,400,120, Cl. 409-132.000.

Ebert, Harry K., Jr., to Bell Telephone Laboratories, Incorporated. Uninterruptible power supplies. 4,400,624, Cl. 307-43.000.

EC Erdolchemie GmbH: *See*—
Alter, Eduard; Bruns, Ludwig; and Volprecht, Werner, 4,400,308, Cl. 252-463.000.

Eco-Pool Design Limited: *See*—
Bastenhof, Dirk, 4,400,273, Cl. 210-284.000.

Eda, Kazuo; Inada, Masanori; and Matsuoka, Michio, to Matsushita Electric Industrial Co., Ltd. Voltage-dependent resistor. 4,400,683, Cl. 338-21.000.

Edison, Lamonte R.: *See*—
Brown, Ronald E.; Edison, Lamonte R.; and Higdon, William D., 4,400,681, Cl. 338-4.000.

Edwards, Jerry L.: *See*—
Pickett, Teddy L.; and Edwards, Jerry L., 4,400,114, Cl. 405-303.000.

Edwards, Michael L.: *See*—
Ritter, Harry W.; and Edwards, Michael L., 4,400,380, Cl. 424-248.500.

EECO Incorporated: *See*—
Bruder, Frank J.; and Taylor, Robert D., 4,400,597, Cl. 200-6.00B.

Egami, Tsuneyuki: *See*—
Kohama, Tokio; Obayashi, Hideki; Kawai, Hisasi; and Egami, Tsuneyuki, 4,399,697, Cl. 73-204.000.

Eger, Gunter: *See*—
Rosenthal, Heinrich; Schinkel, Ingo; Eger, Gunter; and Bair, Wolfgang, 4,400,428, Cl. 428-349.000.

Eguchi, Seiji: *See*—
Suzuki, Seigo; and Eguchi, Seiji, 4,400,771, Cl. 364-200.000.

Eguchi, Shusaku: *See*—
Kotera, Noboru; Eguchi, Shusaku; Teraoka, Masanori; Takahashi, Kenji; and Miyahara, Junji, 4,400,619, Cl. 250-327.200.

Ehrentraut, Otto, to Miba Gleitlager Aktiengesellschaft. Sliding surface bearing for heavy loads. 4,400,099, Cl. 384-283.000.

Eichler, Kenneth M.: *See*—
Mandel, Alan F.; Eichler, Kenneth M.; and Bauman, Douglas A., 4,400,786, Cl. 364-513.000.
Mandel, Alan F.; and Eichler, Kenneth M., 4,400,787, Cl. 364-513.000.

Eidels-Dubovoy, Samuel. Resealable easy-opening container. 4,399,926, Cl. 220-288.000.

Eigen, Heinrich: *See*—
Buchmann, Kurt; Eigen, Heinrich; and Reiter, Norbert, 4,400,116, Cl. 407-3.000.

Eilerman, Robert G.: *See*—
Willis, Brian J.; Eilerman, Robert G.; and Yurecko, John M., Jr., 4,400,545, Cl. 568-377.000.

Einstein, Harry; and Grimes, Patrick G., to Exxon Research and Engineering Co. Electrochemical construction. 4,400,448, Cl. 429-34.000.

Eisenberg, Jack; and Monaghen, Verlan D. Wheelchair carrier and loading device. 4,400,129, Cl. 414-462.000.

Eldurail Industrie en Handelsonderneming B.V.: *See*—
Duis, Arnoldus T. H., 4,400,656, Cl. 318-798.000.

Eli Lilly and Company: *See*—
Douthart, Richard J.; Kleinschmidt, Walter J.; and Schultz, Richard M., 4,400,375, Cl. 424-85.000.
Michel, Karl H.; and Hoehn, Marvin M., 4,400,510, Cl. 544-347.000.
Suarez, Tulio; and Jones, C. David, 4,400,543, Cl. 568-327.000.
Yang, Kuo S., 4,400,503, Cl. 544-28.000.

Elliott, Mark L., to Magnetic Peripherals Inc. Digital speed control for a brushless DC motor. 4,400,654, Cl. 318-312.000.

Elliott Turbomachinery Co., Inc.: *See*—
Geary, Carl H., Jr.; and Samurin, Norman A., 4,399,651, Cl. 60-39.020.
Miller, Arthur J.; and Kostors, Charles H., 4,400,137, Cl. 416-220.00R.

Ellis, J. R. B.; and Fries, Bernard A., to Chevron Research Company. Method for the ultimate disposal of high level radioactive waste. 4,400,314, Cl. 252-633.000.

Ellis, John: *See*—
Murphy, John M.; Spensley, Robert H.; and Ellis, John, 4,399,911, Cl. 206-219.000.

Ellmann, Susan O.: *See*—
Aviram, Ari; and Ellmann, Susan O., 4,400,100, Cl. 400-120.000.

Eloy, Fernand: *See*—
Amselem, Armand; Eloy, Fernand; and Maffrand, Jean-Pierre, 4,400,384, Cl. 424-256.000.

Emery, Francis, to C I Designs, Inc. Laminated wood corner structure for furniture. 4,399,754, Cl. 108-159.000.

Emhart Industries, Inc.: *See*—
Chestnut, Benjamin F., 4,400,685, Cl. 338-172.000.

Emig, Gerd: *See*—
Hofmann, Hanns; Emig, Gerd; and Ruppert, Wolfgang, 4,400,568, Cl. 585-443.000.

Emmons, William D.; and Lavelle, Joseph A., to Rohm and Haas Company. Acrylic polymer concrete compositions. 4,400,413, Cl. 427-136.000.

Endo, Hiroshi; and Baba, Kousaku, to Nissan Motor Co., Ltd. Distributor with sliding contacts. 4,399,779, Cl. 123-146.50A.

Energy Conversion Devices, Inc.: *See*—
Izu, Masatsugu; Cannella, Vincent D.; and Ovshinsky, Stanford R., 4,400,409, Cl. 427-39.000.

Energy Development Associates, Inc.: *See*—
Hacha, Thomas H., 4,400,446, Cl. 429-19.000.

Engstrom Medical AB: *See*—
Kindlund, Alf R.; and Lundstrom, Kurt I., 4,399,686, Cl. 73-23.000.

Entex Industries, Inc.: *See*—
Wessels, John A.; and Chen, Feng I., 4,400,698, Cl. 340-825.720.

Environmental Chemicals, Inc.: *See*—
Cardarelli, Nathan F., 4,400,374, Cl. 424-78.000.

Epson Corporation: *See*—
Kitado, Haruo, 4,400,791, Cl. 364-900.000.

Erdman, Maiya E.: *See*—
Shutov, Gennady M.; Erdman, Maiya E.; Solomakha, Adel I.; and Kalennikov, Evgeny A., 4,400,495, Cl. 524-176.000.

Erdmann, Joachim C.; Gellert, Robert I.; and Jeppsson, Jan, to Boeing Company, The. Apparatus and method for sheet metal part alignment. 4,399,675, Cl. 72-37.000.

Ernest, Raymond; and Ginsburg, Stephen J. Modular interproximal toothbrush system. 4,399,582, Cl. 15-176.000.

Esco Corporation: *See*—
Deline, Richard R.; and Miner, William R., 4,400,132, Cl. 414-569.000.

Esquire, Inc.: *See*—
Schweickardt, Karl, 4,400,754, Cl. 361-38.000.

Ethyl Corporation: *See*—
Sanders, Robert N., 4,400,366, Cl. 423-329.000.

Ethyl Products Company: *See*—
King, Roderick V., 4,399,679, Cl. 72-117.000.

Eurotech International Limited: *See*—
Sweeney, William T., 4,400,134, Cl. 415-62.000.

Evans, Arthur, to Boeing Company, The. Wing leading edge slat. 4,399,970, Cl. 244-214.000.

Evans, Hugh G.; Speer, Stephen; Christy, James S.; and Lafrenz, Stanley S. Aircraft air conditioning system. 4,399,665, Cl. 62-239.000.

Everall, Palmer B., Jr.; and Lowery, Jack R., Sr., to Springs Mills, Inc. Mechanism for stacking and accumulating stacks of flat flexible articles. 4,399,991, Cl. 271-175.000.

Everett/Charles, Inc.: *See*—
Long, David J., 4,400,728, Cl. 358-107.000.

Everts & Van der Weyden Exploitatiemaatschappij Ewem B.V.: *See*—
Lubbers, Marius H., 4,399,941, Cl. 238-349.000.

Exxon Research and Engineering Co.: *See*—
Bearden, Roby, Jr.; and Schucker, Robert C., 4,400,262, Cl. 208-8.00R.
Cooke, Theodore M.; Lin, Robert A.; Whitfield, Richard G.; and Hock, Allan G., 4,400,215, Cl. 106-22.000.
Einstein, Harry; and Grimes, Patrick G., 4,400,448, Cl. 429-34.000.
Lagace, Linda S.; Miller, Richard C.; and Young, David A., 4,400,299, Cl. 252-413.000.
Wortel, Theodorus M.; and Schutten, Jan H., 4,400,567, Cl. 585-428.000.

Faber, Marcel, to Hydrocarbon Research Inc. Process for producing adipic acid from biomass. 4,400,468, Cl. 435-142.000.

Fair, Walter B., Jr.: *See*—
Richardson, Edwin A.; and Fair, Walter B., Jr., 4,399,868, Cl. 166-300.000.

Fairhurst, David, to United Kingdom of Great Britain and Northern Ireland, The Secretary of State for Defence in Her Britannic Majes-

ty's Government of the. Adsorption onto charcoal cloth. 4,400,250, Cl. 204-180.00R.

Fanizza, Michael A.; and Schmid, Richard G., to Zenith Radio Corporation. Optical assembly for projection television receiver. 4,400,723, Cl. 358-60.000.

Fanthorpe, Michael M.: *See—*
Rainey, David K.; and Fanthorpe, Michael M., 4,400,542, Cl. 568-315.000.

Fantuzzo, Joseph: *See—*
Anderson, David G.; Bigenwald, John J.; and Fantuzzo, Joseph, 4,399,933, Cl. 222-407.000.

Farabaugh, Aloysius W., to PPG Industries, Inc. Method of and apparatus for determining optical quality of an article. 4,400,089, Cl. 356-382.000.

Farina, Alfred J.: *See—*
Craig, Laurence B.; and Farina, Alfred J., 4,400,152, Cl. 431-328.000.

Farkas, Daniel S., to Owens-Illinois, Inc. Apparatus and method for generating clock pulses from a power selsyn multiple motor drive system for a glassware forming machine. 4,400,192, Cl. 65-29.000.

Farmitalia Carlo Erba, S.p.A.: *See—*
Zetler, Gerhard; Rossi, Alessandro; and De Paolis, Chiara, 4,400,377, Cl. 424-177.000.

Farnhill, William M.: *See—*
Parker, Alan; and Farnhill, William M., 4,399,650, Cl. 57-401.000.

Fate, William A.: *See—*
Kushida, Toshimoto; and Fate, William A., 4,400,684, Cl. 338-25.000.

Favier, Colette; Pinhas, Henri; Beranger, Serge; and Pascal, Jean-Claude, to Laroche-Navarron, S.A. Piperazine derivatives of theophylline. 4,400,381, Cl. 424-248.520.

Featherston, Robert D.: *See—*
Silano, Michael A.; and Featherston, Robert D., 4,400,480, Cl. 524-47.000.

Febrag AG Watt: *See—*
Frey, Markus, 4,400,156, Cl. 432-222.000.

Fehrenbacher, Wolfgang, to Kundo-Kieninger & Obergfell. Alarm-setting mechanism for timepiece with escapement protecting against reverse rotation. 4,400,094, Cl. 368-266.000.

Fehrmann, George L.; and Stubblefield, Samuel M., Jr., to Apcom, Inc. Mounting assembly for heater thermostat control. 4,399,971, Cl. 248-221.300.

Feinstein, Allen I.: *See—*
Feld, Raymond C.; and Feinstein, Allen I., 4,400,573, Cl. 585-481.000.

Feld, Raymond C.; and Feinstein, Allen I., to Standard Oil Company (Indiana). Modification of hydrocarbon conversion processes over crystalline borosilicate catalysts by addition of an alcohol or ether. 4,400,573, Cl. 585-481.000.

Felix, Kenneth A.: *See—*
Kaman, Richard A.; Felix, Kenneth A.; Smanski, Philip J.; and Haug, John R., 4,400,585, Cl. 179-2.0EB.

Felix, Raymond A., to Stauffer Chemical Company. Substituted benzyloxy chloroethoxy ethane herbicide antidotes. 4,400,204, Cl. 71-100.000.

Feller, Murray F., to Wilgood Corporation. Flow sensor probes. 4,399,696, Cl. 73-195.000.

Felt Products Mfg. Co.: *See—*
Moerk, John C., Jr., 4,400,000, Cl. 277-235.00B.

Fenter, William S., to Honeywell Information Systems Inc. Self start flyback power supply. 4,400,767, Cl. 363-21.000.

Ferguson, Phillip R.: *See—*
Bakken, Wendell J.; and Ferguson, Phillip R., 4,400,420, Cl. 428-99.000.

Ferreira, Laurence E.: *See—*
Mukamal, Harold; Lamar, Richard S.; and Ferreira, Laurence E., 4,400,485, Cl. 524-444.000.

Fetters, Wayne A. Tree cutting mechanism. 4,399,848, Cl. 144-34.00E.

Fiat Auto S.p.A.: *See—*
Contato, Ugo, 4,399,888, Cl. 180-315.000.

Fickes, Michael G.; and Rakoczy, Bohdan, to Du Pont de Nemours, E. I., and Company. Process for surface treatment of flexographic printing plates containing butadiene/acrylonitrile copolymers. 4,400,460, Cl. 430-306.000.

Fiedler, Hand: *See—*
Hittel, Gerhard; Fiedler, Hand; and Groh, Hans, 4,399,670, Cl. 66-84.00A.

Fields, Craig I., to United States of America, Army. Virtual space teleconference system. 4,400,724, Cl. 358-85.000.

Filter, Harold E.: *See—*
Roberson, Keith; and Filter, Harold E., 4,400,313, Cl. 252-628.000.

Filtertek, Inc.: *See—*
Leason, Hayden, 4,400,277, Cl. 210-441.000.

Findeisen, Kurt: *See—*
Haas, Peter; Muller, Heinz; Seifert, Peter; Wagner, Kuno; Findeisen, Kurt; and Konig, Klaus, 4,400,331, Cl. 260-932.000.

Finnerty, Anthony A.: *See—*
Youngberg, Charles L.; Miller, Charles G., deceased; Stephens, James B.; and Finnerty, Anthony A., 4,400,191, Cl. 65-21.400.

Finney, Roy P.; Lynch, Henry W.; and Trick, Robert E., to Medical Engineering Corporation. Implantable penile erectile system. 4,399,811, Cl. 128-79.000.

Firestone, Raymond A., to Merck & Co., Inc. Allylsulfoxide enzyme inhibitors. 4,400,395, Cl. 424-319.000.

Firestone Tire & Rubber Company, The: *See—*
Hausch, Walter R., 4,399,652, Cl. 152-353.00R.

Fischbacher, David R.: *See—*
Miskowicz, John S.; and Fischbacher, David R., 4,399,955, Cl. 242-107.40A.

Fischer, Peter Axel: *See—*
Henk, Peter O., 4,400,449, Cl. 429-59.000.

Fishwick, Brian R.: *See—*
Austin, Peter W.; and Fishwick, Brian R., 4,400,322, Cl. 260-205.000.

Fisons Limited: *See—*
Rainey, David K.; and Fanthorpe, Michael M., 4,400,542, Cl. 568-315.000.

Flamm, Peter M., to ITT Industries, Inc. MOS Parallel A/D converter. 4,400,693, Cl. 340-347.0AD.

Fleiter, Lothar: *See—*
Dhein, Rolf; and Fleiter, Lothar, 4,400,489, Cl. 525-301.500.

Fletcher, Christine M.: *See—*
O'Dell, William R.; and Fletcher, Christine M., 4,400,820, Cl. 378-209.000.

Flexiblast Company: *See—*
Price, Harry S., III; and Brooks, Frank W., 4,399,677, Cl. 72-40.000.

Flomar Enterprises: *See—*
Ostermaier, Albert E., 4,399,594, Cl. 24-201.00A.

Flower, George W.: *See—*
Bowyer, John M.; Flower, George W.; and Maluke, Edward M., 4,399,752, Cl. 102-217.000.

Fohl, Artur, to REPA Feinstanzwerk GmbH. Pyrotechnical driving device especially for a retightening device of a safety belt system. 4,399,655, Cl. 60-637.000.

Foley, James E. Internal combustion engine. 4,399,784, Cl. 123-198.00F.

Ford Motor Company: *See—*
Kushida, Toshimoto; and Fate, William A., 4,400,684, Cl. 338-25.000.
Marcil, Jacques N., 4,399,859, Cl. 164-342.000.
Rumpel, Manfred, 4,400,008, Cl. 280-666.000.

Forestlane Co., Ltd.: *See—*
Krane, Jan G., 4,400,750, Cl. 360-105.000.

Forges, Robert: *See—*
Abbes, Claude; Rouaud, Christian; Forges, Robert; and de Villepoix, Raymond, 4,400,018, Cl. 285-31.000.

Fork, Richard L.; Greene, Benjamin I.; and Shank, Charles V., to Bell Telephone Laboratories, Incorporated. Subpicosecond ring laser. 4,400,814, Cl. 372-94.000.

Forward, Cleve H.: *See—*
Butler, James R.; Forward, Cleve H.; and Robison, Thomas W., 4,400,570, Cl. 585-467.000.

Foster Wheeler Energy Corporation: *See—*
McMahon, Joseph F.; and Steiner, Peter, 4,400,309, Cl. 252-472.000.
Vatsky, Joel, 4,400,151, Cl. 431-184.000.

Frame, Norman J., to W. H. Brady Co. Capacitance switch arrangement. 4,400,758, Cl. 361-290.000.

Franchi, Gianfranco; and Gamba, Giovanni, to Le Armerie Italiane F.LLI Gamba S.n.c. Firing mechanism for firearms. 4,399,628, Cl. 42-42.00R.

Francis, Robert S.; and Stofer, Bruce C., to Tektronix, Inc. Memory patching system. 4,400,798, Cl. 365-174.000.

Francombe, Roger: *See—*
Demmer, Christopher G.; Francombe, Roger; Garnish, Edward W.; and Massy, Derek J. R., 4,400,229, Cl. 156-307.500.

Franke, Konrad; and Weber, Christoph, to Woelke Magnetbandtechnik GmbH & Co. KG. Carrier device for magnetic-electric transducer on a read/write unit operating with magnetic storage plates. 4,400,749, Cl. 360-104.000.

Franklin Institute, The: *See—*
Pytlewski, Louis L.; Krevitz, Kenneth; and Smith, Arthur B., 4,400,552, Cl. 568-715.000.

Franz Plasser Bahnbaumaschinen Industriegesellschaft mbH: *See—*
Theurer, Josef; and Pichler, Johann, 4,399,753, Cl. 104-7.00B.
Theurer, Josef; and Riessberger, Klaus, 4,399,881, Cl. 177-137.000.

Frederick Duffield Pty. Limited: *See—*
Duffield, Frederick R., 4,400,021, Cl. 285-247.000.

Fredin, Bo; and Nylund, Olov, to AB Asea Atom. Absorber member for mounting in the lattice of a boiling water reactor. 4,400,347, Cl. 376-333.000.

Freebairn, Hugh T.; and Towns, Tony L., to Catalytic Generators, Inc. Ethylene gas generating composition. 4,400,291, Cl. 252-188.30R.

Freed, Meier E., to American Home Products Corporation. 2-Substituted octahydropyrrolo(1,2-A)-pyrazine-3-carboxylic acids. 4,400,511, Cl. 544-349.000.

Freeman, Victor L. Mobile reinforced concrete pipe machine. 4,400,108, Cl. 405-155.000.

Freitag, Herbert; and Schnitzius, Klaus, to Stabilus GmbH. Gas spring arrangement operating as an electrical connection. 4,400,600, Cl. 200-52.00R.

Freller, Helmut; and Schack, Peter, to Siemens Aktiengesellschaft. Method for preparing transparent, electrically conducting indium oxide (In_2O_3) films. 4,400,254, Cl. 204-192.00P.

Fremed, Erika: *See—*
Currie, Glenn E.; and Fremed, Erika, 4,400,697, Cl. 340-711.000.

Fremery, Max; and Korff, Joachim, to Braunkohlen Kraftstoff Aktiengesellschaft. Process for the o-substitution of phenols. 4,400,557, Cl. 568-804.000.

Frey, Markus, to Febrag AG Watt. Gas burner. 4,400,156, Cl. 432-222.000.

Frey, Volker: *See*—
Artes, Reinhold; Frey, Volker; Graf, Werner; and Zeller, Norbert, 4,400,528, Cl. 556-430.000.
Fricke, Richard J.: *See*—
Kennedy, Richard B., 4,400,475, Cl. 521-103.000.
Fried. Krupp Gesellschaft mit beschrankter Haftung: *See*—
Buchmann, Kurt; Eigen, Heinrich; and Reiter, Norbert, 4,400,116, Cl. 407-3.000.
Coenen, Hubert; Hagen, Rainer; and Knuth, Manfred, 4,400,398, Cl. 426-429.000.
Fries, Bernard A.: *See*—
Ellis, J. R. B.; and Fries, Bernard A., 4,400,314, Cl. 252-633.000.
Frissora, Joseph R.; and Platt, Michael H., to Owens-Illinois, Inc. Drainable solar collector unit. 4,399,808, Cl. 126-420.000.
Fritz, Conrad M., to Keystone Engineering Company. High performance low torque anti-friction bearing assembly. 4,400,042, Cl. 308-227.000.
Fritzsche Dodge & Olcott Inc.: *See*—
Willis, Brian J.; Eilerman, Robert G.; and Yurecko, John M., Jr., 4,400,545, Cl. 568-377.000.
Frohberger, Paul-Ernst: *See*—
Timmler, Helmut; Buchel, Karl H.; Brandes, Wilhelm; Frohberger, Paul-Ernst; and Scheinpflug, Hans, 4,400,388, Cl. 424-269.000.
Frost, Albert C., to Union Carbide Corporation. Methanation of gas streams containing carbon monoxide and hydrogen. 4,400,575, Cl. 585-733.000.
Fruck, Benant E., to Unisert Systems, Inc. Multilayer pipe joint. 4,400,019, Cl. 285-55.000.
Fruzzetti, Paul, to Varian Associates, Inc. Vacuum leak detector having single valve assembly. 4,399,690, Cl. 73-40.700.
Frye, Cecil L.: *See*—
Daudt, William H.; Frye, Cecil L.; and Hyde, James F., 4,400,326, Cl. 260-429.00R.
Fuchs, Otto; and Kroh, Adolf, to Hoechst Aktiengesellschaft. Quinacridone mixtures, process for their manufacture and their use as pigments. 4,400,515, Cl. 546-57.000.
Fuchs, Rainer: *See*—
Jautelat, Manfred; Arlt, Dieter; Lantzsch, Reinhard; Fuchs, Rainer; Riebel, Hans-Jochem; Schroder, Rolf; and Harnisch, Horst, 4,400,523, Cl. 549-320.000.
Fuhs, Hans L. Hair-tinting implement. 4,399,827, Cl. 132-112.000.
Fuji Jukogyo Kabushiki Kaisha: *See*—
Kataoka, Ryuji, 4,399,790, Cl. 123-440.000.
Shikata, Makoto, 4,399,776, Cl. 123-41.080.
Tanaka, Takayuki; Kadoi, Noriaki; and Yoshimoto, Akio, 4,399,775, Cl. 123-41.080.
Fuji Photo Film Co., Ltd.: *See*—
Kotera, Noboru; Eguchi, Shusaku; Teraoka, Masanori; Takahashi, Kenji; and Miyahara, Junji, 4,400,619, Cl. 250-327.200.
Mori, Sumio, 4,400,777, Cl. 364-200.000.
Sato, Masamichi; Hasegawa, Eiichi; and Shimanuki, Koji, 4,400,454, Cl. 430-7.000.
Fuji Photo Optical Co., Ltd.: *See*—
Akiyama, Kazuhiko; Yoshino, Takeshi; Shiina, Michihiro; Sato, Shigeo; Nishizawa, Tetsuo; Yoshida, Toshio; and Kobayashi, Nobuo, 4,400,074, Cl. 354-173.000.
Fuji Xerox Co., Ltd.: *See*—
Arai, Yoshio; Kataoka, Hiroyuki; Suzuki, Isao; and Itoh, Satoru, 4,400,737, Cl. 358-263.000.
Fujii, Takashi: *See*—
Katagiri, Masayoshi; Ogura, Osamu; and Fujii, Takashi, 4,399,735, Cl. 91-369.00B.
Fujimoto, Einosuke: *See*—
Yokoyama, Shigeo; Misumi, Teruyuki; Fujimoto, Einosuke; and Kobayashi, Yutaka, 4,400,199, Cl. 71-88.000.
Fujinami, Kimiya: *See*—
Minato, Ichiro; Shibata, Koichi; and Fujinami, Kimiya, 4,400,525, Cl. 549-552.000.
Fujisawa Pharmaceutical Company, Limited: *See*—
Takaya, Takao; Takasugi, Hisashi; Tsuji, Kiyoshi; and Chiba, Toshiyuki, 4,400,379, Cl. 424-246.000.
Fujishiro, Takeshi, to Nissan Motor Co., Ltd. Electrostatic type fuel measuring device. 4,399,699, Cl. 73-304.00C.
Fujiso, Tokuo; Nomura, Soichi; and Ohmori, Tadashi, to Nippon Oil Company, Ltd. Isomerization catalyst and process for production thereof. 4,400,574, Cl. 585-671.000.
Fujita, Hironori: *See*—
Arai, Tohru; Fujita, Hironori; and Takada, Yasuo, 4,400,224, Cl. 148-15.000.
Fujitsu Limited: *See*—
Asami, Fumitaka; and Takagi, Osamu, 4,400,615, Cl. 377-28.000.
Irie, Syouzi; and Hirakawa, Osamu, 4,400,795, Cl. 365-1.000.
Kaneda, Saburo; Matsumura, Naomi; Ikegami, Fujio; Shimizu, Kazuyuki; and Ikuta, Yukichi, 4,400,769, Cl. 364-200.000.
Kurafuji, Setsuo, 4,400,800, Cl. 365-190.000.
Fukui, Kiyoshi; Kakeya, Noboru; Jibiki, Hiroshi; and Matsuo, Fumio, to UBE Industries, Ltd. Orotic acid derivatives. 4,400,508, Cl. 544-313.000.
Fukukura, Kazutoyo; and Lynn, William J., to AMP Incorporated. Membrane switch with sequentially closable contacts. 4,400,596, Cl. 200-5.00A.
Fukuta, Kenji: *See*—
Tokushima, Yasuo; Fukuta, Kenji; and Takahashi, Yoshinobu, 4,399,768, Cl. 118-423.000.
Fukuvi Chemical Industry Co., Ltd.: *See*—
Ishiguro, Jiro; and Maruya, Kazuo, 4,400,433, Cl. 428-408.000.
Fulton, Theodore A., to Bell Telephone Laboratories, Incorporated. High current gain Josephson junction circuit. 4,400,631, Cl. 307-245.000.
Funato, Masayoshi; and Watanabe, Katunori, to Toyota Jidosha Kogyo Kabushiki Kaisha. Change-speed transmission for wheeled vehicles. 4,399,717, Cl. 74-339.000.
Funck, Herbert. Padded sole having orthopaedic properties. 4,399,620, Cl. 36-30.00R.
Fundom, Danny L., to Van Dorn Company. Pouring spout steel can end construction. 4,399,925, Cl. 220-269.000.
Funk, Gary L.; Huang, Warren H.; and Stewart, William S., to Phillips Petroleum Company. Control of a cracking furnace. 4,400,784, Cl. 364-500.000.
Furbershaw, Gerard A.: *See*—
McNaughton, Allen D.; Albert, Stephen B.; and Furbershaw, Gerard A., 4,400,170, Cl. 604-62.000.
Furuichi, Tokinori; Ikoma, Junichi; Oguri, Masao; Miura, Yoshio; and Shimizu, Keizo, to Hitachi, Ltd. Stylus position detecting apparatus. 4,400,807, Cl. 369-220.000.
Furuno Electric Co., Ltd.: *See*—
Nagao, Syuji; Nakai, Ryoichi; and Yamauchi, Kazuo, 4,400,780, Cl. 364-449.000.
G. Bauknecht GmbH: *See*—
Glasmacher, Peter, 4,400,699, Cl. 340-825.220.
Gagnon, David C. Carburetion system. 4,399,794, Cl. 123-523.000.
Galland, Frank J., to Patology Press, Ltd. Typesetting apparatus. 4,400,106, Cl. 400-617.000.
Galle, Edward M.: *See*—
Ratcliff, Frank C.; and Galle, Edward M., 4,400,024, Cl. 285-356.000.
Gallina, Kurt, to C. Eugen Maier Metallverarbeitung GmbH. Spinning flyer construction. 4,399,649, Cl. 57-115.000.
Gamba, Giovanni: *See*—
Franchi, Gianfranco; and Gamba, Giovanni, 4,399,628, Cl. 42-42.00R.
Gancy, Alan B. Water-activated exothermic chemical deicing formulations. 4,400,285, Cl. 252-70.000.
Garcia, Philippe, to Micro Mega Societe Anonyme. Control release for a tool grip for a dental handpiece. 4,400,158, Cl. 433-127.000.
Gardineer, Bayard; Mezrich, Reuben S.; and Leber, George W., to Technicare Corporation. Ultrasound scanner having compound transceiver for multiple optimal focus. 4,399,704, Cl. 73-642.000.
Gardner, David M.: *See*—
Clark, Roger T.; and Gardner, David M., 4,400,304, Cl. 252-430.000.
Gargano, William L. B., to Strong, Edward. Gliding parachute. 4,399,969, Cl. 244-145.000.
Garnache, Richard R.: *See*—
Dash, Somanath; Garnache, Richard R.; and Troutman, Ronald R., 4,399,605, Cl. 29-571.000.
Garnish, Edward W.: *See*—
Demmer, Christopher G.; Francombe, Roger; Garnish, Edward W.; and Massy, Derek J. R., 4,400,229, Cl. 156-307.500.
Garstang, James H.: *See*—
Davies, Haydn S.; Garstang, James H.; and Timmins, Cyril, 4,400,182, Cl. 48-214.00A.
Gateway Industries, Inc.: *See*—
Miskowicz, John S.; and Fischbacher, David R., 4,399,955, Cl. 242-107.40A.
Gawol, Manfred: *See*—
Haacke, Wigo; Adrian, Gerhard; Gawol, Manfred; Henbach, Rainer; and 37, 4,400,365, Cl. 423-306.000.
GC Industries: *See*—
Chand, Ramesh, 4,399,942, Cl. 239-34.000.
Geary, Carl H., Jr.; and Samurin, Norman A., to Elliott Turbomachinery Co., Inc. Method for starting an FCC power recovery string. 4,399,651, Cl. 60-39.020.
Gebr. Isringhausen: *See*—
Pietsch, Helge, 4,400,033, Cl. 297-417.000.
Geiler, Volkmar: *See*—
Mennemann, Karl; Gliemeroth, Georg; and Geiler, Volkmar, 4,400,473, Cl. 501-77.000.
Gelardi, Anthony L.; Gelardi, Paul J.; and MacLeod, Robert B., Jr., to Shape Inc. Cassette container with flexible and hinged drawers. 4,399,913, Cl. 206-387.000.
Gelardi, Paul J.: *See*—
Gelardi, Anthony L.; Gelardi, Paul J.; and MacLeod, Robert B., Jr., 4,399,913, Cl. 206-387.000.
Geldner, Joachim; Rones, Josef; and Danzel, Horst, to Occidental Chemical Corporation. Composition and process for pickling and removing rust from metal. 4,400,289, Cl. 252-142.000.
Gellert, Robert I.: *See*—
Erdmann, Joachim C.; Gellert, Robert I.; and Jeppsson, Jan, 4,399,675, Cl. 72-37.000.
General Battery Corporation: *See*—
Eberle, William J., 4,400,120, Cl. 409-132.000.
General Dynamics, Pomona Division: *See*—
Wedertz, Larry D.; Niemeier, Byron M.; and Ross, Oakley G., 4,399,962, Cl. 244-3.230.
General Electric Company: *See*—
Aneja, Viney P., 4,400,553, Cl. 568-724.000.
Boggi, John J.; Centrone, Gerald V.; Dolin, Aaron M.; and Sherman, Ira N., 4,400,825, Cl. 378-150.000.
Horrigan, Raymond J., deceased, 4,400,226, Cl. 156-56.000.
Lezan, Georges R. E., 4,400,755, Cl. 361-91.000.
Lohrey, Edwin J., 4,400,646, Cl. 313-333.000.

Mendiratta, Ashok K., 4,400,555, Cl. 568-728.000.
Morris, George E.; and Woodward, Stewart A., 4,400,628, Cl. 307-118.000.
O'Dell, William R.; and Fletcher, Christine M., 4,400,820, Cl. 378-209.000.
Penn, William B.; and Reynolds, Kenneth R., 4,399,949, Cl. 242-1.000.
Popelish, John A., 4,400,613, Cl. 219-497.000.

General Foods Corporation: *See*—
Langston, Metty S. K.; and Maing, Il-Young, 4,400,400, Cl. 426-51.000.

General Motors Corporation: *See*—
Brown, Ronald E.; Edison, Lamonte R.; and Higdon, William D., 4,400,681, Cl. 338-4.000.
Brucken, Byron L., 4,400,601, Cl. 200-81.400.
Kisner, Howard D., 4,400,255, Cl. 204-192.0SP.
Lederman, Frederick E., 4,400,041, Cl. 308-219.000.
Romblom, Edward R.; and Sundeen, Arthur R., 4,399,799, Cl. 123-571.000.
Schubert, Malvin L., 4,399,736, Cl. 91-469.000.
Stoltman, Donald D., 4,399,798, Cl. 123-571.000.
Thebert, Glenn W., 4,400,135, Cl. 415-134.000.
Thomas, Robert D., 4,400,336, Cl. 264-46.700.

General Refractories Company: *See*—
Henry, Francis W., Jr., 4,399,982, Cl. 266-45.000.

Gentry, Gary F., to Owens-Corning Fiberglas Corporation. Method of making lengths of flexible insulated air duct with end collars. 4,400,228, Cl. 156-144.000.

Gentry, Herbert H. Wheel stabilizing device. 4,400,037, Cl. 301-5.0BA.

Gentry, Larry L.; and Klootwyk, Ronald I., to Mobil Oil Corporation. Complaint riser yoke assembly with breakway support means. 4,400,109, Cl. 405-195.000.

Gerardi, John A.: *See*—
Chan, Shiu K.; Gerardi, John A.; and McGilvray, Bruce L., 4,400,770, Cl. 364-200.000.

Gerber Products Company: *See*—
Vibbert, Bruce L.; Billerbeck, Fred W.; and Hoersten, Kenneth P., 4,400,402, Cl. 426-471.000.

Gerenser, Robert J.; and Littauer, Ernest L., to Continental Group, Inc., The. Combined current collector and electrode separator. 4,400,447, Cl. 429-27.000.

Gergen, William P.; and Halper, Walter M., to Shell Oil Company. Molding compounds comprising a mixture of block copolymers employed as a modifier for thermosetting unsaturated polyester resin compositions. 4,400,478, Cl. 523-514.000.

Gerhardi & Cie, Firma: *See*—
Schloemer, Gerhard; and Steinweg, Klaus, 4,399,641, Cl. 52-309.100.

Gerlt, Roy R. Graphic display and tonal value determinator. 4,400,161, Cl. 434-104.000.

Getzlaff, Klaus J.: *See*—
Bazlen, Dieter; Bock, Dietrich W.; Getzlaff, Klaus J.; Hajdu, Johann; and Painke, Helmut, 4,400,776, Cl. 364-200.000.

Gfeller, Fritz: *See*—
Chevillat, Pierre R.; and Gfeller, Fritz, 4,400,616, Cl. 235-487.000.

Giardino, David A.: *See*—
Wallace, William K.; Giardino, David A.; and Groshans, Joseph R., 4,400,785, Cl. 364-508.000.

Gibbons, Ralph D., to Lansing Bagnall Limited. Wire-laying tool. 4,399,842, Cl. 140-92.100.

Gibson, Charles A.; and Winters, John R., to Union Carbide Corporation. Process for the manufacture of ethylenediamine. 4,400,539, Cl. 564-480.000.

Giddings, Brandford E.; Jorkasky, Richard J., II; and Thornton, Kim L., to Standard Oil Company, The. Esters as processing aids for olefinic nitrile copolymers. 4,400,484, Cl. 524-296.000.

Giddings & Lewis, Inc.: *See*—
Reed, Robert E., 4,399,603, Cl. 29-568.000.

Giebeler, Robert H., Jr., to Varian Associates, Inc. Accelerator side cavity coupling adjustment. 4,400,650, Cl. 315-5.410.

Gilbert Engineering Co., Inc.: *See*—
Hayward, Robert D., 4,400,050, Cl. 339-177.00R.

Gilman, Lester J., to Kiddo Consumer Durables Corporation. Thermal switch housing. 4,400,673, Cl. 337-380.000.

Ginatta, Marco V., to Metals Technology & Instrumentation, Inc. Method of producing metals by cathodic dissolution of their compounds. 4,400,247, Cl. 204-59.00M.

Ginns, Paul A.: *See*—
Parlour, Henry W.; and Ginns, Paul A., 4,399,596, Cl. 27-4.000.

Ginsburg, Stephen J.: *See*—
Ernest, Raymond; and Ginsburg, Stephen J., 4,399,582, Cl. 15-176.000.

Gisser, Alfons: *See*—
von Werner, Konrad; and Gisser, Alfons, 4,400,325, Cl. 260-408.000.

Gist-Brocades N.V.: *See*—
Bijlenga, Gosse, 4,400,472, Cl. 435-235.000.
Bruynes, Cornelis A.; and Jurriens, Theodorus K., 4,400,509, Cl. 544-315.000.

Giudicelli, Don P.: *See*—
Kaplan, Jean-Pierre; Jalfre, Naurice; and Giudicelli, Don P., 4,400,394, Cl. 424-319.000.

Givens, Edwin N.; and Ying, David H. S., to International Coal Refining Company. Process for coal liquefaction by separation of entrained gases from slurry exiting staged dissolvers. 4,400,261, Cl. 208-8.0LE.

Glacier Metal Company Limited, The: *See*—
Beazley, Rodney T.; and Haggett, Mervyn T., 4,400,167, Cl. 494-49.000.

Glasmacher, Peter, to G. Bauknecht GmbH. Program selection apparatus. 4,400,699, Cl. 340-825.220.

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Hackett, Kenneth P., 4,399,682, Cl. 72-359.000.

Glebova, Erika D.: *See*—
Shevakin, Jury F.; Seidaliev, Fikrat; S.; Tjushevsky, Vladimir M.; Krasovsky, Jury V.; Glebova, Erika D.; and Chivikin, Valery K., 4,400,605, Cl. 219-61.000.

Gleinig, Harald: *See*—
Linhart, Karl; Gleinig, Harald; Raue, Roderich; and Kuhlthau, Hans-Peter, 4,400,321, Cl. 260-186.000.

Gliemeroth, Georg: *See*—
Mennemann, Karl; Gliemeroth, Georg; and Geiler, Volkmar, 4,400,473, Cl. 501-77.000.

Godsoe, Robert J.; and Wenner, Jack W., to International Business Machines Corp. Constant force windup spring web threading system. 4,399,959, Cl. 242-195.000.

Goettl, Adam D. Evaporative cooler with improved air handling mechanism. 4,400,185, Cl. 55-257.00C.

Golden, Donald P., Jr.: *See*—
Vivian, John; Cooper, Patrick R.; Higgins, Ronald B.; Harlan, John A.; Perry, Paul M.; Vallhonrat, Juan B.; and Golden, Donald P., Jr., 4,400,778, Cl. 364-200.000.

Golovyashin, Jury V.: *See*—
Vishnevsky, Vladimir S.; Koval, Vitaly S.; Lavrinenko, Vyacheslav V.; Boichenko, Oleg L.; Kartashev, Igor A.; Golovyashin, Jury V.; Serov, Nikolai F.; Shinkarenko, Leonid I.; and Jurash, Oleg G., 4,400,641, Cl. 310-323.000.

Goodall, Brian L.; van der Nat, Adrianus A.; and Sjardijn, Willem, to Shell Oil Company. Olefin polymerization catalyst compositions and a process for the polymerization of olefins employing such compositions. 4,400,302, Cl. 252-429.00B.

Goodboy, George O., Jr., to Joy Manufacturing Company. Baghouse valve construction. 4,399,837, Cl. 137-614.110.

Goodwin, Robert J.: *See*—
Wetzel, William H.; Pan, Hsi-Lung; Goodwin, Robert J.; and Wilkinson, John E., 4,400,556, Cl. 568-776.000.

Goodyear Aerospace Corporation: *See*—
Bowyer, John M.; Flower, George W.; and Maluke, Edward M., 4,399,752, Cl. 102-217.000.

Goodyear Tire & Rubber Company, The: *See*—
Lal, Joginder; and Walters, Sandra J., 4,400,488, Cl. 525-211.000.
Logan, Brian M., 4,400,342, Cl. 264-501.000.
Milan, Ernest A., 4,399,725, Cl. 83-17.000.

Gordon, Arnold Z., to Diamond Shamrock Corporation. Solar energy converter. 4,400,451, Cl. 429-111.000.

Gordon, Charles O., Jr., to Montigny, Joseph W. Gold pan. 4,400,269, Cl. 209-447.000.

Gorelik, Roman. Chain for a trolley conveyor system. 4,399,909, Cl. 198-852.000.

Gorges, Friedrich J.: *See*—
Bard, Ronald E.; Gorges, Friedrich J.; and Halsey, Robert M., 4,399,642, Cl. 52-483.000.

Gorler, Klaus: *See*—
Madaus, Rolf; Stumpf, Werner; Gorler, Klaus; and Carcasona-Beltran, Alfonso, 4,400,535, Cl. 562-584.000.

Goslarer Farbenwerke: *See*—
Haacke, Wigo; Adrian, Gerhard; Gawol, Manfred; Henbach, Rainer; and 37, 4,400,365, Cl. 423-306.000.

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Shevakin, Jury F.; Seidaliev, Fikrat; S.; Tjushevsky, Vladimir M.; Krasovsky, Jury V.; Glebova, Erika D.; and Chivikin, Valery K., 4,400,605, Cl. 219-61.000.

Gotanda, Motohiro. Lock device. 4,399,673, Cl. 70-276.000.

Goto, Masayuki: *See*—
Ishikawa, Masashi; Shimada, Masatoshi; Okamoto, Katsutomo; Sugita, Shigeyoshi; Goto, Masayuki; Koizumi, Yukuo; and Kaneda, Osamu, 4,400,782, Cl. 364-481.000.

Goto, Toshiki: *See*—
Asano, Hiroshi; Shimamune, Takayuki; Goto, Toshiki; Nitta, Hideo; and Hosonuma, Masashi, 4,400,408, Cl. 427-35.000.

Gournay, Luke S., to Mobil Oil Corporation. Applications of borehole gravimetric techniques to determine residual oil saturation. 4,399,693, Cl. 73-152.000.

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Carr, Neil; Gray, George W.; and Kelly, Stephen M., 4,400,061, Cl. 350-350.000.

Gozzo, Franco; Boschi, Pier M.; and Longoni, Angelo, to Montedison S.p.A. Phosphoric esters derived from 1,2,4-triazole having an insecticidal, nematocidal and acaricidal action, and their preparation. 4,400,517, Cl. 548-118.000.

Graanderivatan Raffinaderijen Amylum, in het kort: G.R. Amylum, vroeger Glucose ries reunies genoemd: *See*—
Vanderputten, Robert; Vandewalle, Oscar; and Van Den Broeke, Julien, 4,400,219, Cl. 127-23.000.

Graber Industries, Inc.: *See*—
Ohman, Thor, 4,399,917, Cl. 211-87.000.
Volfson, Boris, 4,399,855, Cl. 160-23.00R.

Grabow, Kurt: *See*—
Dworak, Wilhelm; Muller, Karl-Heinz; Mayer, Siegfried; Talmon, Wolfgang; and Grabow, Kurt, 4,400,146, Cl. 418-131.000.

Graf, Werner: *See*—
Artes, Reinhold; Frey, Volker; Graf, Werner; and Zeller, Norbert, 4,400,528, Cl. 556-430.000.

Grande, Johannes: *See*—
Brown, James H.; and Grande, Johannes, 4,400,811, Cl. 371-69.000.

Gray, George W.: *See*—
Carr, Neil; Gray, George W.; and Kelly, Stephen M., 4,400,061, Cl. 350-350.000.

Grayson, Paul E.: *See*—
Ownby, Paul D.; and Grayson, Paul E., 4,400,232, Cl. 156-601.000.

Green, Geoffrey W.; and Lettington, Alan H., to National Research Development Corporation. Coating insulating materials by glow discharge. 4,400,410, Cl. 427-39.000.

Green, Jeffrey W., to Hutchinson Technology Incorporated. Laminated encoder disc. 4,400,443, Cl. 428-571.000.

Greenberg, Charles B.: *See*—
Breininger, J. Shannon; and Greenberg, Charles B., 4,400,436, Cl. 428-434.000.
Scanlon, J. Kevin; and Greenberg, Charles B., 4,400,412, Cl. 427-87.000.

Greene, Benjamin I.: *See*—
Fork, Richard L.; Greene, Benjamin I.; and Shank, Charles V., 4,400,814, Cl. 372-94.000.

Greller, Peter, to Pfaff Industriemaschinen GmbH. Device for handling stacks of flexible objects. 4,400,124, Cl. 414-43.000.

Grimes, Patrick G.: *See*—
Einstein, Harry; and Grimes, Patrick G., 4,400,448, Cl. 429-34.000.

Grochowski, Horst; and Knoblauch, Karl, to Bergwerksverband GmbH. Method for the removal of sulfur oxides and nitrogen oxides from exhaust gases. 4,400,363, Cl. 423-239.000.

Groh, Hans: *See*—
Hittel, Gerhard; Fiedler, Hand; and Groh, Hans, 4,399,670, Cl. 66-84.00A.

Groshans, Joseph R.: *See*—
Wallace, William K.; Giardino, David A.; and Groshans, Joseph R., 4,400,785, Cl. 364-508.000.

Grove, Louise A., administratrix: *See*—
Grove, William S., deceased, 4,400,530, Cl. 560-21.000.

Grove Valve and Regulator Company: *See*—
Van Scoy, Davis A., 4,399,708, Cl. 73-861.610.

Grove, William S., deceased (by Grove, Louise A., administratrix), to PPG Industries, Inc. Process for preparing substituted diphenyl ethers. 4,400,530, Cl. 560-21.000.

Grubbs, William A.: *See*—
McCray, Charles M.; and Grubbs, William A., 4,400,104, Cl. 400-320.000.

Gruetzmacher, Robert R.; Munger, Stanley H.; and Warfield, Peter F., to Du Pont de Nemours, E. I., and Company. Process for bromine surface treatment of photosensitive elastomeric flexographic printing plates. 4,400,459, Cl. 430-306.000.

Grund, Norbert: *See*—
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GTE Automatic Electric Labs Inc.: *See*—
Stobbs, William; Hines, Charles; and Light, Rickey W., 4,400,588, Cl. 179-81.00R.

GTE Laboratories Incorporated: *See*—
Briere, Alfred D., 4,400,190, Cl. 65-13.000.
Moschetti, Anthony P.; Smith, J. Thomas; Quackenbush, Carr L. W.; Lingertat, Helmut; and Nehring, Vincent W., 4,400,427, Cl. 428-332.000.

GTE Labs Inc.: *See*—
Stobbs, William; Hines, Charles; and Light, Rickey W., 4,400,588, Cl. 179-81.00R.

Guarasci, Mario: *See*—
Hayden, Rodney; and Guarasci, Mario, 4,400,761, Cl. 361-400.000.

Guay, Roger G.: *See*—
Bollinger, Wayne A.; and Guay, Roger G., 4,400,276, Cl. 210-323.200.

Gudger, Keith H., to Intel Corporation. Non-volatile memory cell. 4,400,799, Cl. 365-95.000.

Guldman, Thomas A. R.: *See*—
Buckley, Bruce S.; and Guldman, Thomas A. R., 4,399,807, Cl. 126-418.000.

Gulf Research & Development Company: *See*—
Singerman, Gary M.; Ryu, Yumi P.; and Anglin, James R., 4,400,282, Cl. 252-32.70E.

Gulf & Western Manufacturing Company: *See*—
Bottelson, Thomas J., 4,400,672, Cl. 335-202.000.

Gunti, Rolf, to Masyc AG. Structural element. 4,399,908, Cl. 198-789.000.

Gutentag, Charles, to Tempo G. Jewelry retaining means including compensation means for dimensional variations in objects retained therein. 4,399,910, Cl. 206-0.820.

Guyette, Richard R.: *See*—
Brown, Paul J.; Dugan, Robert J.; and Guyette, Richard R., 4,400,773, Cl. 364-200.000.

Haacke, Wigo; Adrian, Gerhard; Gawol, Manfred; Henbach, Rainer; and 37, to Goslarer Farbenwerke; and Dr. Hans Heubach GmbH & Co. KG. Method for the manufacture of aluminum zinc phosphate hydrates or basic aluminum zinc phosphate hydrates. 4,400,365, Cl. 423-306.000.

Haas, Peter; Muller, Heinz; Seifert, Peter; Wagner, Kuno; Findeisen, Kurt; and Konig, Klaus, to Bayer Aktiengesellschaft. Dialkoxy-phosphonyl-N-alkyl-formic acid amides. 4,400,331, Cl. 260-932.000.

Hacha, Thomas H., to Energy Development Associates, Inc. Halogen hydrate storage device for mobile zinc-chloride battery systems. 4,400,446, Cl. 429-19.000.

Hackett, Kenneth P., to Gleason Works, The. Method for cold forming metal articles having diverging members. 4,399,682, Cl. 72-359.000.

Haendle, Joerg, to Siemens Aktiengesellschaft. X-Ray diagnostic installation for radiography and fluoroscopy. 4,400,823, Cl. 378-113.000.

Hafferty, Brendan P.: *See*—
Ebdon, Leslie C.; and Hafferty, Brendan P., 4,400,243, Cl. 204-1.00T.

Hafner, Joseph A. Panel lock structure. 4,399,643, Cl. 52-530.000.

Hagen, Rainer: *See*—
Coenen, Hubert; Hagen, Rainer; and Knuth, Manfred, 4,400,398, Cl. 426-429.000.

Haggar Company: *See*—
Off, Joseph W. A.; and Early, Judson H., 4,400,165, Cl. 493-457.000.

Haggett, Mervyn T.: *See*—
Beazley, Rodney T.; and Haggett, Mervyn T., 4,400,167, Cl. 494-49.000.

Hagiwara, Noboru: *See*—
Kobayashi, Tetuo; and Hagiwara, Noboru, 4,399,901, Cl. 192-111.00A.

Hagiwara, Tsuneo; and Horike, Akihiro, to Teijin Limited. Benzil ketal derivatives. 4,400,519, Cl. 548-461.000.

Hahn, Clive E. W.: *See*—
Albery, Wyndham J.; and Hahn, Clive E. W., 4,400,242, Cl. 204-1.00T.

Hahnkamm, Volker: *See*—
Buxbaum, Gunter; Pflugmacher, Ingo; Hund, Franz; Hahnkamm, Volker; and Woditsch, Peter, 4,400,432, Cl. 428-403.000.

Hajdu, Johann: *See*—
Bazlen, Dieter; Bock, Dietrich W.; Getzlaff, Klaus J.; Hajdu, Johann; and Painke, Helmut, 4,400,776, Cl. 364-200.000.

Hakansson, Sven: *See*—
Larsson. Hans F.; and Hakansson, Sven, 4,400,280, Cl. 210-802.000.

Halcon SD Group, Inc., The: *See*—
Bhise, Vijay S., 4,400,559, Cl. 568-858.000.
Storm, David A., 4,400,364, Cl. 423-247.000.

Hale, John R., to RCA Corporation. Self-indexing insulating support rods for an electron gun assembly. 4,400,644, Cl. 313-256.000.

Halferty, Patrick W.: *See*—
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Hall, Charles P., to Monterey Manufacturing, Inc. Waterbed mattress with unattached baffle structure. 4,399,575, Cl. 5-450.000.

Halper, Walter M.: *See*—
Gergen, William P.; and Halper, Walter M., 4,400,478, Cl. 523-514.000.

Halsey, Robert M.: *See*—
Bard, Ronald E.; Gorges, Friedrich J.; and Halsey, Robert M., 4,399,642, Cl. 52-483.000.

Halvorson, Thomas G.: *See*—
Vogler, William E., Jr.; and Halvorson, Thomas G., 4,399,660, Cl. 62-52.000.

Hamilton Industries, Inc.: *See*—
Zboralski, Jon A., 4,399,740, Cl. 98-115.0LH.
Zboralski, Jon A., 4,399,741, Cl. 98-115.0LH.

Hanamura, Yoshimi; Yuyama, Masahiro; and Sakuramoto, Akira, to Sumitomo Chemical Company, Limited. Rotating disc evapo-extrusion process and apparatus. 4,400,236, Cl. 159-2.00E.

Hancock, David S.; and Holman, James R., to Western Electric Company, Inc. Cable end cap removal method. 4,399,602, Cl. 29-426.400.

Hanna, Marie R.: *See*—
Licciardello, Michael; Boden, Richard M.; Watkins, Hugh; and Hanna, Marie R., 4,400,290, Cl. 252-174.110.

Hanneken, Henry P.: *See*—
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Hans-Jurgen, Busack; Kaross, Klaus; and Rinne, Helmut, to Dragerwerk Aktiengesellschaft. Measuring device for facilitating the electrical measurement of a substance. 4,400,258, Cl. 204-415.000.

Hans Widmaier Fabrik fur Apparate der Fernmelde-und Feinwerktechnik: *See*—
Kunz, Kurt, 4,400,593, Cl. 200-5.00A.

Hanscom, Bradford E., to T.A.D. Avanti, Inc. Remote message repeat control for telephone answering system. 4,400,586, Cl. 179-6.110.

Hanson, Richard A., to Sundstrand Data Control, Inc. Force transducer flexure with conductors on surfaces in the neutral bending plane. 4,399,700, Cl. 73-517.00B.

Hanyu, Susumu, to Janome Sewing Machine Co. Ltd. Sewing machine housing structure. 4,399,762, Cl. 112-259.000.

Haraguchi, Shosuke: *See*—
Tosaka, Yoichi; Uchidoi, Masanori; Shigeta, Yoshihiro; Yoshikawa, Ryoichi; and Haraguchi, Shosuke, 4,400,073, Cl. 354-173.000.

Harbauer, Paul W.: *See*—
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Harding, Gary C., to Universal Foam Systems, Inc. Foam dispensing gun. 4,399,930, Cl. 222-145.000.

Hari, Stefan; and Wick, Arnold, to Ciba-Geigy Corporation. Monoazo pigments containing heterocycles, and high-molecular organic materials dyed therewith. 4,400,319, Cl. 260-155.000.

Harlan, John A.: *See*—
Vivian, John; Cooper, Patrick R.; Higgins, Ronald B.; Harlan, John A.; Perry, Paul M.; Vallhonrat, Juan B.; and Golden, Donald P., Jr., 4,400,778, Cl. 364-200.000.

Harms, Wolfgang; and Wunderlich, Klaus, to Bayer Aktiengesellschaft. Dioxazine reactive dyestuffs. 4,400,504, Cl. 544-76.000.

Harnisch, Horst: *See*—
Jautelat, Manfred; Arlt, Dieter; Lantzsch, Reinhard; Fuchs, Rainer; Riebel, Hans-Jochem; Schroder, Rolf; and Harnisch, Horst, 4,400,523, Cl. 549-320.000.

Harris, Fritz B. Production of ethanol from Jerusalem Artichokes. 4,400,469, Cl. 435-161.000.

Hartmann, Hans-Heinrich; and Svagr, Alexandr, to SMS Schloemann-Siemag Aktiengesellschaft. Universal rolling mill. 4,399,680, Cl. 72-225.000.

Hartmann, Horst: *See*—
Walkow, Fred; Czerney, Peter; Hartmann, Horst; and Marx, Jorg, 4,400,458, Cl. 430-157.000.

Hasegawa, Eiichi: *See*—
Sato, Masamichi; Hasegawa, Eiichi; and Shimanuki, Koji, 4,400,454, Cl. 430-7.000.

Hasegawa, Shumpei: *See*—
Otsuka, Kazuo; Narasaka, Shin; and Hasegawa, Shumpei, 4,399,792, Cl. 123-489.000.

Hasegawa, Suteto: *See*—
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Hashimoto, Akira: *See*—
Konishi, Shin; Yoshida, Mitsuhiro; Katagiri, Masatake; Somezawa, Masashi; Ninomiya, Yoshinobu; and Hashimoto, Akira, 4,400,498, Cl. 528-60.000.

Hashimoto, Mitsuru; Sakai, Kiyoshi; Ohta, Katsunari; and Kojima, Akio, to Ricoh Company Ltd. Layered organic electrophotographic photoconductor element comprising bisazo generating and hydrazone transport layers. 4,400,455, Cl. 430-59.000.

Hashimoto, Shoichi: *See*—
Omori, Shunji; Hayashi, Kanji; Hiasa, Yukio; Maeda, Nobutaka; Hashimoto, Shoichi; and Yoshiya, Hiroki, 4,399,727, Cl. 83-345.000.

Hatada, Kenji; Yokura, Miyoshi; and Kobayashi, Hiroaki, to Toray Industries, Inc. Fabrics having an excellent color developing property and a process for producing the same involving plasma treatment and an aftercoat. 4,400,424, Cl. 428-212.000.

Hatsuno, Hiroshi, to Diesel Kiki Co., Ltd. Forging of an article having a plurality of longitudinally arranged protuberances. 4,399,681, Cl. 72-342.000.

Haug, John R.: *See*—
Kaman, Richard A.; Felix, Kenneth A.; Smanski, Philip J.; and Haug, John R., 4,400,585, Cl. 179-2.0EB.

Haughey, Douglas P.; and Millar, Malcolm H., to Interox Chemicals Limited. Production of alkali metal or alkaline earth metal peroxides. 4,399,633, Cl. 47-57.600.

Hausch, Walter R., to Firestone Tire & Rubber Company. The. Application of ambient temperature cured polymers or prepolymers to a cured elastomer. 4,399,852, Cl. 152-353.00R.

Hauser, Herbert J., Jr., to Deere & Company. Interference fit cylinder liner. 4,399,783, Cl. 123-193.0CH.

Hawkins, Keith C.: *See*—
Pollard, Ian E.; and Hawkins, Keith C., 4,400,332, Cl. 261-1.000.

Hayakawa, Takashi: *See*—
Takehira, Katsuomi; Ishikawa, Toshio; Hayakawa, Takashi; and Imamura, Juichi, 4,400,544, Cl. 568-360.000.

Hayase, Masahiro: *See*—
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Hayashi, Daisaku: *See*—
Ohtsuka, Katsuyuki; Miyo, Hiroaki; and Hayashi, Daisaku, 4,400,604, Cl. 219-10.55M.

Hayashi, Kanji: *See*—
Omori, Shunji; Hayashi, Kanji; Hiasa, Yukio; Maeda, Nobutaka; Hashimoto, Shoichi; and Yoshiya, Hiroki, 4,399,727, Cl. 83-345.000.

Hayashi, Yukihiro; Sueyoshi, Toshinobu; Hirai, Shigeo; Kishimoto, Mikio; Tashita, Katsunori; and Amemiya, Masahiro, to Hitachi Maxell, Ltd. Method for production of metal magnetic particles. 4,400,337, Cl. 264-82.000.

Hayashida, Bun, to Nippon Kogaku K.K. F(θ) Lens system of four-group construction. 4,400,063, Cl. 350-415.000.

Hayden, Rodney; and Guarasci, Mario, to TRW Inc. Compact relay system. 4,400,761, Cl. 361-400.000.

Hayward, Robert D., to Gilbert Engineering Co., Inc. Fitting for coaxial cable. 4,400,050, Cl. 339-177.00R.

Heffner, Robert E.; and Davidson, John J., to Aluminum Company of America. Method and apparatus for simultaneously electrocoating the interior and exterior of a metal container. 4,400,251, Cl. 204-181.00R.

Hefti, Walter, to Rieter Machine Works Ltd. Traversing apparatus for a cutting machine for a synthetic filament tow. 4,399,589, Cl. 19-0.600.

Heilskov, Jens A., to Ray-Jens Corporation. Anchoring device for flexible ladder. 4,399,891, Cl. 182-150.000.

Heinze, Roland: *See*—
Wirtzfeld, Alexander; Heinze, Roland; Bock, Thomas; and Liess, Hans D., 4,399,820, Cl. 128-419.0PG.

Heitmann, William E.; and Sulewski, Richard J., to Inland Steel Company. Hot rolled steel product and method for producing same. 4,400,223, Cl. 148-12.00F.

Helger, Roland: *See*—
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Heline, Ture A., Jr., to Armtec Industries, Inc. Overtemperature detection cable. 4,400,680, Cl. 337-415.000.

Helm, Rudolf: *See*—
Richter, Roland; Muller, Hanns P.; Wagner, Kuno; Helm, Rudolf; and Zander, Jurgen, 4,400,560, Cl. 568-863.000.

Helmac Products Corporation: *See*—
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Henbach, Rainer: *See*—
Haacke, Wigo; Adrian, Gerhard; Gawol, Manfred; Henbach, Rainer; and 37, 4,400,365, Cl. 423-306.000.

Henderson, Larry D.: *See*—
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Hendrischk, Wolfgang, to Mannesmann Aktiengesellschaft. High-quality/high-speed matrix printing. 4,400,101, Cl. 400-124.000.

Henk, Peter O., to Henk, Peter O.; and Fischer, Peter Axel. Lead salt electric storage battery. 4,400,449, Cl. 429-59.000.

Henningsson, Goran, to Ludvig Svensson (Holland) B.V. Green-house curtain. 4,399,671, Cl. 66-196.000.

Henrich, Edmund; Hufner, Reinhold; and Weirich, Friedhelm, to Kernforschungszentrum Karlsruhe GmbH. Processes for separating the noble fission gases xenon and krypton from waste gases from nuclear plants. 4,400,183, Cl. 55-44.000.

Henry, Francis W., Jr., to General Refractories Company. Heavy petroleum oil plasticized, tar bonded taphole mix. 4,399,982, Cl. 266-45.000.

Henslee, Walter W.; Lindsey, John S.; Morrow, Stanley J.; Periard, John N.; and Whitworth, Charles R., to Dow Chemical Company, The. Magnesium aluminum spinels. 4,400,431, Cl. 428-402.000.

Her Majesty the Queen as represented by the Minister of National Defence of her Majesty's Canadian Government: *See*—
Cielo, Paolo G., 4,400,056, Cl. 350-96.190.

Herbertz, Toni: *See*—
Reinehr, Ulrich; Herbertz, Toni; Jungverdorben, Hermann J.; and Dross, Joachim, 4,400,339, Cl. 264-206.000.

Hercules Incorporated: *See*—
Klosiewicz, Daniel W., 4,400,340, Cl. 264-328.600.
Majewicz, Thomas G., 4,400,502, Cl. 536-87.000.

Herder, N.V.: *See*—
McCarroll, Raymond A., 4,399,586, Cl. 16-31.00R.

Hermann Berstorff Maschinenbau GmbH: *See*—
Chszaniecki, Siegfried; and Brand, Wilhelm, 4,399,719, Cl. 74-410.000.
Koch, Klaus; and Syrbius, Gerhard, 4,400,218, Cl. 127-1.000.

Herve, Jean J.; and Smolikowski, Serge, to Roussel Uclaf. Novel acaricide compositions. 4,400,392, Cl. 424-304.000.

Hesler, Benjamin F., to Carrier Corporation. Mechanical control system for preventing compressor lubrication pump cavitation in a refrigeration system. 4,399,663, Cl. 62-193.000.

Hewlett-Packard GmbH: *See*—
Kible, Dieter, 4,400,801, Cl. 365-195.000.

Hiasa, Yukio: *See*—
Omori, Shunji; Hayashi, Kanji; Hiasa, Yukio; Maeda, Nobutaka; Hashimoto, Shoichi; and Yoshiya, Hiroki, 4,399,727, Cl. 83-345.000.

Hicks, James S.: *See*—
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Hideshima, Makoto: *See*—
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Higdon, William D.: *See*—
Brown, Ronald E.; Edison, Lamonte R.; and Higdon, William D., 4,400,681, Cl. 338-4.000.

Higgins, Ronald B.: *See*—
Vivian, John; Cooper, Patrick R.; Higgins, Ronald B.; Harlan, John A.; Perry, Paul M.; Vallhonrat, Juan B.; and Golden, Donald P., Jr., 4,400,778, Cl. 364-200.000.

Hile, James R., to Carrier Corporation. Method and apparatus for proven demand air conditioning control. 4,399,862, Cl. 165-2.000.

Hillman, Leon, to ADCO Aerospace, Inc. Ultraviolet apparatus for disinfection and sterilization of fluids. 4,400,270, Cl. 210-103.000.

Hines, Charles: *See*—
Stobbs, William; Hines, Charles; and Light, Rickey W., 4,400,588, Cl. 179-81.00R.

Hinn, Werner, to RCA Corporation. Dynamic de-emphasis compensation system. 4,400,720, Cl. 358-25.000.

Hirai, Shigeo: *See*—
Hayashi, Yukihiro; Sueyoshi, Toshinobu; Hirai, Shigeo; Kishimoto, Mikio; Tashita, Katsunori; and Amemiya, Masahiro, 4,400,337, Cl. 264-82.000.

Hirakawa, Kazumi: *See*—
Takemura, Shuji; Hirakawa, Kazumi; and Yoshizumi, Tsuneto, 4,400,706, Cl. 346-135.100.

Hirakawa, Osamu: *See*—
Irie, Syouzi; and Hirakawa, Osamu, 4,400,795, Cl. 365-1.000.

Hiramatsu, Uji: *See*—
Ohsaka, Yohnosuke; Hiramatsu, Uji; and Honda, Toshihide, 4,400,563, Cl. 570-144.000.

Hirano, Toshio: *See*—
Saito, Takashi; Hirano, Toshio; and Kumaki, Takashi, 4,400,808, Cl. 369-262.000.

Hiromasa, Syunichiro; Omori, Norio; Kawashima, Yutaka; and Muto, Yukio, to Nippondenso Co., Ltd. Gas flow measuring apparatus. 4,399,698, Cl. 73-204.000.

Hirsbrunner, Hans G.: *See*—
Cobb, Carleton M., III; Morin, Roland G.; and Hirsbrunner, Hans G., 4,400,677, Cl. 337-6.000.

Hirsch, Stephen P., to Realist, Inc. Microfiche reader carrier assembly. 4,400,068, Cl. 353-27.00R.

Hisamitsu Pharmaceutical Co., Inc.: *See*—
Noda, Kanji; Nakagawa, Akira; Motomura, Toshiharu; and Ide, Hiroyuki, 4,400,520, Cl. 548-472.000.

Hitachi Chemical Company, Ltd.: *See*—
Takahashi, Akio; Itoh, Yutaka; Shimazaki, Takeshi; Wajima, Motoyo; Morishita, Hirosada; Mizuno, Yutaka; Yokozawa, Shunya; and Tsukanishi, Kenji, 4,400,438, Cl. 428-458.000.

Hitachi Denshi Kabushiki Kaisha: *See*—
Tominaga, Tamotsu, 4,400,751, Cl. 360-107.000.

Hitachi, Ltd.: *See*—
Furuichi, Tokinori; Ikoma, Junichi; Oguri, Masao; Miura, Yoshio; and Shimizu, Keizo, 4,400,807, Cl. 369-220.000.
Izumi, Masayuki; and Takeda, Renzo, 4,400,343, Cl. 376-417.000.
Kobayashi, Junichi; Mifune, Takao; and Tanabe, Shoji, 4,400,639, Cl. 310-215.000.
Mitsuya, Munehisa; Terao, Motoyasu; Ota, Sakae; Taniguchi, Yoshio; Kaku, Toshimitsu; and Horigome, Shinkichi, 4,400,707, Cl. 346-135.100.
Nagae, Yoshiharu; Ito, Tetsuo; Kitajima, Masaaki; Kawakami, Hideaki; Nakano, Fumio; Abe, Hidetoshi; Isogai, Masato; Ooue, Michio; and Mukoh, Akio, 4,400,059, Cl. 350-332.000.
Suzuki, Katsumichi, 4,399,702, Cl. 73-597.000.
Taguchi, Sadanori; Honda, Yukio; Aida, Toshiyuki; and Kawabe, Ushio, 4,400,648, Cl. 313-346.00R.
Takeuchi, Yoshinobu; Kuroda, Katsuhiro; and Ozasa, Susumu, 4,400,622, Cl. 250-396.0ML.

Hitachi Maxell, Ltd.: *See*—
Hayashi, Yukihiro; Sueyoshi, Toshinobu; Hirai, Shigeo; Kishimoto, Mikio; Tashita, Katsunori; and Amemiya, Masahiro, 4,400,337, Cl. 264-82.000.

Hitachi Metals, Ltd.: *See*—
Uchida, Norimasa, 4,400,222, Cl. 148-6.110.

Hitachi Shipbuilding and Engineering Company Limited: *See*—
Tomita, Yukio; Wakabayashi, Takayuki; Oda, Noriyuki; and Yamamoto, Hirotaka, 4,400,184, Cl. 55-106.000.

Hittel, Gerhard; Fiedler, Hand; and Groh, Hans, to Karl Mayer Textilmaschinenfabrik GmbH. Apparatus for transferring weft threads in a wrap knitting machine. 4,399,670, Cl. 66-84.00A.

Hobbs, James W., to Phillips Petroleum Company. Constraint control of a fractional distillation process. 4,400,239, Cl. 196-132.000.

Hock, Allan G.: *See*—
Cooke, Theodore M.; Lin, Robert A.; Whitfield, Richard G.; and Hock, Allan G., 4,400,215, Cl. 106-22.000.

Hodosh, Milton. Method for treating gingival and periodontal tissues. 4,400,373, Cl. 424-49.000.

Hoechst Aktiengesellschaft: *See*—
Albrecht, Konrad; and Langeluddeke, Peter, 4,400,196, Cl. 71-86.000.
Braun, Albert; Portz, Willi; Strauss, Georg; and Delhey, Hans-Martin, 4,400,292, Cl. 252-189.000.
Dettbarn, Hans-Jurgen; and Zimmermann, Josef, 4,400,171, Cl. 604-68.000.
Dettbarn, Hans-Jurgen; and Zimmermann, Josef, 4,400,172, Cl. 604-70.000.
Fuchs, Otto; and Kroh, Adolf, 4,400,515, Cl. 546-57.000.
Hutschenreuter, Elfriede; and Klaus, Andrae, 4,399,839, Cl. 138-118.100.
Lal, Bansi; D'Sa, Adolf; Dornauer, Horst; and de Souza, Noel J., 4,400,506, Cl. 544-246.000.
Martini, Thomas; and Rosch, Gunter, 4,400,294, Cl. 252-301.240.
Moraw, Roland; and Schadlich, Renate, 4,400,057, Cl. 350-162.200.
Rammelt, Peter-Paul; and Siegemund, Gunter, 4,400,546, Cl. 568-386.000.
von Werner, Konrad; and Gisser, Alfons, 4,400,325, Cl. 260-408.000.

Hoehn, Marvin M.: *See*—
Michel, Karl H.; and Hoehn, Marvin M., 4,400,510, Cl. 544-347.000.

Hoersten, Kenneth P.: *See*—
Vibbert, Bruce L.; Billerbeck, Fred W.; and Hoersten, Kenneth P., 4,400,402, Cl. 426-471.000.

Hoettels, Ronald W., to Teledyne Industries, Inc. Engine block. 4,399,777, Cl. 123-55.00R.

Hoffmann, Ralph, to Trochoid Power Corporation. Driveshaft arrangement for a rotary expansible chamber device. 4,400,145, Cl. 418-61.00A.

Hofmann, Hanns; Emig, Gerd; and Ruppert, Wolfgang, to Hofmann, Hanns; Emig, Gerd; and Ruppert, Wolfgang. Process for preparing styrene, and an appropriate agent. 4,400,568, Cl. 585-443.000.

Hofmann, Peter: *See*—
Muller, Wolfgang H. E.; and Hofmann, Peter, 4,400,300, Cl. 252-414.000.

Hoganas AB: *See*—
Ivarsson, Lennart P.; and Blom, Ingvar G. A., 4,400,335, Cl. 264-30.000.

Hogen-Esch, Thieo E.: *See*—
Butler, George B.; Hogen-Esch, Thieo E.; Meister, John J.; and Pledger, Huey, Jr., 4,400,496, Cl. 527-312.000.

Hohmann, Eugen, to Siemens Aktiengesellschaft. Device for sterilizing medical and dental objects. 4,400,357, Cl. 422-297.000.

Hoke, Donald I., to Lubrizol Corporation, The. Liquid fuels containing polyamine dispersants. 4,400,178, Cl. 44-72.000.

Holderith, Anton. Water saving toilet control valve. 4,399,835, Cl. 137-414.000.

Holland, Bernard C., Jr.: *See*—
Stock, William H.; and Holland, Bernard C., Jr., 4,399,968, Cl. 244-137.00R.

Holland, Charles R.; and Vogt, Carl L., to Coin Acceptors, Inc. Coin-handling escrow assembly. 4,399,902, Cl. 194-1.00D.

Holman, James R.: *See*—
Hancock, David S.; and Holman, James R., 4,399,602, Cl. 29-426.400.

Holmer, Heinz E. A., to AB Volvo. Method for pilot injection of fuel in diesel engines. 4,399,786, Cl. 123-301.000.

Holstedt, Richard A.: *See*—
Jessup, Peter; Holstedt, Richard A.; and Baron, Kenneth, 4,400,284, Cl. 252-49.600.

Holt, Steven L.: *See*—
Durenec, Peter; and Holt, Steven L., 4,399,661, Cl. 62-65.000.

Holtgraver, Edward G., to Keystone International, Inc. Valve assembly. 4,399,833, Cl. 137-315.000.

Honda Giken Kogyo Kabushiki Kaisha: *See*—
Okada, Motohiro, 4,399,887, Cl. 180-282.000.
Wakou, Susumu; and Kadowaki, Satoshi, 4,400,607, Cl. 219-86.800.

Honda Motor Co., Ltd.: *See*—
Otsuka, Kazuo; Narasaka, Shin; and Hasegawa, Shumpei, 4,399,792, Cl. 123-489.000.

Honda, Toshihide: *See*—
Ohsaka, Yohnosuke; Hiramatsu, Uji; and Honda, Toshihide, 4,400,563, Cl. 570-144.000.

Honda, Yukio: *See*—
Taguchi, Sadanori; Honda, Yukio; Aida, Toshiyuki; and Kawabe, Ushio, 4,400,648, Cl. 313-346.00R.

Honeywell Inc.: *See*—
Durand, William W.; and Peterson, Ronald E., 4,400,058, Cl. 350-166.000.
Wamstad, David B., 4,399,707, Cl. 73-727.000.

Honeywell Information Systems Inc.: *See*—
Fenter, William S., 4,400,767, Cl. 363-21.000.

Honig, Helmut: *See*—
Doetsch, Werner; Honig, Helmut; and Siegel, Rudolf, 4,400,367, Cl. 423-463.000.

Honjo, Katsuhiko: *See*—
Ogawa, Yasuhiro; Shida, Sankichi; Honjo, Katsuhiko; and Todoroki, Tsunehiko, 4,400,214, Cl. 106-1.130.

Honma, Kazuo, to TOSO Kabushiki Kaisha. Roller assembly fitting device for use in a roller blind. 4,399,857, Cl. 160-323.00R.

Honshu Seishi Kabushiki Kaisha: *See*—
Takemura, Shuji; Hirakawa, Kazumi; and Yoshizumi, Tsuneto, 4,400,706, Cl. 346-135.100.

Hopper, Steven P.: *See*—
Kanner, Bernard; Schilling, Curtis L., Jr.; and Hopper, Steven P., 4,400,526, Cl. 556-420.000.

Horigome, Shinkichi: *See*—
Mitsuya, Munehisa; Terao, Motoyasu; Ota, Sakae; Taniguchi, Yoshio; Kaku, Toshimitsu; and Horigome, Shinkichi, 4,400,707, Cl. 346-135.100.

Horike, Akihiro: *See*—
Hagiwara, Tsuneo; and Horike, Akihiro, 4,400,519, Cl. 548-461.000.

Horike, Masanori, to Ricoh Company, Ltd. Ink jet printing apparatus. 4,400,705, Cl. 346-75.000.

Horn & Gladden Lint Cleaner Company, Inc.: *See*—
Schwartz, Robert C.; and Sparks, John E., 4,399,591, Cl. 19-202.000.

Horodysky, Andrew G.; and Kaminski, Joan M., to Mobil Oil Corporation. Multifunctional lubricant additives and compositions thereof. 4,400,283, Cl. 252-32.70E.

Horrigan, Doris C., executrix: *See*—
Horrigan, Raymond J., deceased, 4,400,226, Cl. 156-56.000.

Horrigan, Raymond J., deceased (by Horrigan, Doris C., executrix), to General Electric Company. Method of making an insulated electromagnetic coil. 4,400,226, Cl. 156-56.000.

Horsley, Larry. Outlet box mounting. 4,399,922, Cl. 220-3.600.

Hosaka, Akio: *See*—
Oshiage, Katsunori; and Hosaka, Akio, 4,399,802, Cl. 123-609.000.

Hosokawa, Mikio, to Maeda Industries, Ltd. Quick-release type hub for bicycles. 4,400,038, Cl. 301-111.000.

Hosonuma, Masashi: *See*—
Asano, Hiroshi; Shimamune, Takayuki; Goto, Toshiki; Nitta, Hideo; and Hosonuma, Masashi, 4,400,408, Cl. 427-35.000.

Hotta, Shigeo; and Yamamoto, Katsumi, to Toyoda Koki Kabushiki Kaisha. Numerical controller for cam grinding machine. 4,400,781, Cl. 364-474.000.

Houle, Raymond T., to Silchor. Manual in-door lock arrangement for bathing units. 4,399,569, Cl. 4-555.000.

Hourihan, James. Golf aid. 4,399,994, Cl. 273-191.00R.

Howard, George A. Fluid intake openings for a suction dredger. 4,399,622, Cl. 37-57.000.

Howe, Lenard R. Tag threader apparatus. 4,399,599, Cl. 29-241.000.

HRI, Inc.: *See*—
Kydd, Paul H.; Chervenak, Michael C.; and DeVaux, George R., 4,400,263, Cl. 208-10.000.

Huang, Warren H.: *See*—
Funk, Gary L.; Huang, Warren H.; and Stewart, William S., 4,400,784, Cl. 364-500.000.
Huber, Joel E., to Upjohn Company, The. Grignard reagents prepared from 5-halopentan-2-one propylene ketals. 4,400,524, Cl. 549-369.000.
Hufner, Reinhold: *See*—
Henrich, Edmund; Hufner, Reinhold; and Weirich, Friedhelm, 4,400,183, Cl. 55-44.000.
Hughes Tool Company: *See*—
Baugh, John L.; Montgomery, James W.; and Manderscheid, Phillip H., 4,399,870, Cl. 166-324.000.
Ratcliff, Frank C.; and Galle, Edward M., 4,400,024, Cl. 285-356.000.
Hulsing, Rand H., II; and Peters, Rex B., to Sundstrand Data Control Group. Borehole survey apparatus utilizing accelerometers and probe joint measurements. 4,399,692, Cl. 73-151.000.
Humble, Olle: *See*—
Jansson, Elis, 4,399,616, Cl. 33-161.000.
Hund, Franz: *See*—
Buxbaum, Gunter; Pflugmacher, Ingo; Hund, Franz; Hahnkamm, Volker; and Woditsch, Peter, 4,400,432, Cl. 428-403.000.
Hunter Douglas, Inc.: *See*—
Anderson, Richard N., 4,399,856, Cl. 160-39.000.
Hunter, Theodore K. Vehicle door aligning tool. 4,399,683, Cl. 72-458.000.
Hunton, Thomas M., to Cosden Technology, Inc. Method and apparatus for dehydrogenation of alkylaromatic compounds to produce vinylaromatic monomers. 4,400,569, Cl. 585-444.000.
Hurtado, Hector O.: *See*—
Baro, Juan V.; and Hurtado, Hector O., 4,399,809, Cl. 128-1.00R.
Husqvarna Aktiebolag: *See*—
Bergvall, Bengt A., 4,399,759, Cl. 112-158.00E.
Bergvall, Bengt A., 4,399,760, Cl. 112-158.00E.
Hussey, Sam W., to Reliance Electric Company. Standby A-C power system with transfer compensation circuitry. 4,400,625, Cl. 307-66.000.
Hutchinson, Bruce R.: *See*—
Smith, Willard P.; and Hutchinson, Bruce R., 4,400,150, Cl. 431-170.000.
Hutchinson Technology Incorporated: *See*—
Green, Jeffrey W., 4,400,443, Cl. 428-571.000.
Hutchison, Stanley O.: *See*—
Anderson, Glenn W.; and Hutchison, Stanley O., 4,399,865, Cl. 166-191.000.
Hutschenreuter, Elfriede; and Klaus, Andrae, to Hoechst Aktiengesellschaft. Tubular casing suitable for smoked foodstuffs and process for manufacture and use thereof. 4,399,839, Cl. 138-118.100.
Hyde, James F.: *See*—
Daudt, William H.; Frye, Cecil L.; and Hyde, James F., 4,400,326, Cl. 260-429.00R.
Hydrocarbon Research Inc.: *See*—
Faber, Marcel, 4,400,468, Cl. 435-142.000.
Snell, George J.; and Kydd, Paul H., 4,400,181, Cl. 48-197.00R.
Iato, Michel: *See*—
Castel, Yvon; and Iato, Michel, 4,400,112, Cl. 405-224.000.
Ibrahim, Fayez F., to Tyler Refrigeration Corporation. Island refrigerated display case with air defrost. 4,399,662, Cl. 62-82.000.
Ide, Hiroyuki: *See*—
Noda, Kanji; Nakagawa, Akira; Motomura, Toshiharu; and Ide, Hiroyuki, 4,400,520, Cl. 548-472.000.
Iida, Katsuyoshi: *See*—
Kobayashi, Kazuo; Tanaka, Hideki; Iida, Katsuyoshi; and Kamite, Junji, 4,399,791, Cl. 123-489.000.
Ikeda, Akio: *See*—
Kudo, Takeo; Okada, Yasutaka; Moroishi, Taishi; Ikeda, Akio; Ohtani, Hiroo; and Yoshikawa, Kunihiko, 4,400,209, Cl. 420-443.000.
Kudo, Takeo; Okada, Yasutaka; Moroishi, Taishi; Ikeda, Akio; Ohtani, Hiroo; and Yoshikawa, Kunihiko, 4,400,210, Cl. 420-443.000.
Kudo, Takeo; Okada, Yasutaka; Moroishi, Taishi; Ikeda, Akio; Ohtani, Hiroo; and Yoshikawa, Kunihiko, 4,400,211, Cl. 420-443.000.
Kudo, Takeo; Okada, Yasutaka; Moroishi, Taishi; Ikeda, Akio; Ohtani, Hiroo; and Yoshikawa, Kunihiko, 4,400,349, Cl. 420-443.000.
Ikegami, Fujio: *See*—
Kaneda, Saburo; Matsumura, Naomi; Ikegami, Fujio; Shimizu, Kazuyuki; and Ikuta, Yukichi, 4,400,769, Cl. 364-200.000.
Ikemori, Keiji; and Tajima, Akira, to Canon Kabushiki Kaisha. Zoom lens. 4,400,064, Cl. 350-426.000.
Ikoma, Junichi: *See*—
Furuichi, Tokinori; Ikoma, Junichi; Oguri, Masao; Miura, Yoshio; and Shimizu, Keizo, 4,400,807, Cl. 369-220.000.
Ikuta, Yukichi: *See*—
Kaneda, Saburo; Matsumura, Naomi; Ikegami, Fujio; Shimizu, Kazuyuki; and Ikuta, Yukichi, 4,400,769, Cl. 364-200.000.
Ilenda, Casmir S.: *See*—
Kelley, Everett J.; and Ilenda, Casmir S., 4,400,500, Cl. 528-345.000.
Imai, Hironobu, to NSK-Warner K.K. Safety seat belt system. 4,400,013, Cl. 280-801.000.
Imamura, Juichi: *See*—
Takehira, Katsuomi; Ishikawa, Toshio; Hayakawa, Takashi; and Imamura, Juichi, 4,400,544, Cl. 568-360.000.
Imamura, Kohsei: *See*—
Yamakage, Tetsuro; Yoneda, Takao; and Imamura, Kohsei, 4,400,118, Cl. 408-3.000.
Imanaka, Makoto: *See*—
Ishikawa, Masaaki; Ueda, Syuzo; and Imanaka, Makoto, 4,400,225, Cl. 148-36.000.
IMEC Corporation: *See*—
Curtiss, William P.; and Sharp, Gordon P., 4,400,655, Cl. 318-729.000.
IMI Marston Limited: *See*—
Brodie, George W., 4,399,830, Cl. 137-68.00R.
Imperial Chemical Industries Limited: *See*—
Austin, Peter W.; and Fishwick, Brian R., 4,400,322, Cl. 260-205.000.
Imperial Chemical Industries PLC: *See*—
Candlin, John P.; Caunt, Anthony D.; and Williams, Ian G., 4,400,301, Cl. 252-429.00B.
Lake, Ivan J. S.; and Whittam, Thomas V., 4,400,572, Cl. 585-481.000.
Ramshaw, Colin; and Mallinson, Roger H., 4,400,275, Cl. 210-321.100.
Improtec: *See*—
Braithwaite, David G.; Cheavens, Thomas; and Voyce, Jason M., 4,400,241, Cl. 203-18.000.
Inada, Masanori: *See*—
Eda, Kazuo; Inada, Masanori; and Matsuoka, Michio, 4,400,683, Cl. 338-21.000.
Inanaga, Takuzi: *See*—
Kamimura, Teturo; Komatsubara, Masahiro; Ando, Shizno; Inanaga, Takuzi; and Takahashi, Akira, 4,400,744, Cl. 360-69.000.
Indiana University Foundation: *See*—
Muhler, Joseph C.; Kleber, Carl J.; Ream, Ronald L.; and Moore, David M., 4,400,372, Cl. 424-48.000.
Ingaglio, Michael L., to Bell Telephone Laboratories, Incorporated. Spade lug receptacle fitting tool. 4,399,608, Cl. 29-747.000.
Ingaglio, Michael L., to Bell Telephone Laboratories, Incorporated. Spade lug receptacle fitting tool. 4,399,609, Cl. 29-747.000.
Ingalls, William E., to O'Rourke, Thomas W. Method and structure for adjusting caster or camber. 4,400,007, Cl. 280-661.000.
Ingersol-Rand Company: *See*—
Chaiko, Walter M.; and Larson, John A., 4,400,113, Cl. 405-261.000.
Inland Steel Company: *See*—
Heitmann, William E.; and Sulewski, Richard J., 4,400,223, Cl. 148-12.00F.
Innemee, Hendricus C.; van Meel, Jacobus C. A.; De Jonge, Adriaan; Timmermans, Petrus B. M. W. M.; and van Zwieten, Pieter A., to Karl Thomae Gesellschaft mit beschrankter Haftung. Pharmaceutical composition for the treatment of glaucoma. 4,400,378, Cl. 424-244.000.
Inoue, Nobuyuki: *See*—
Kashiwagi, Takashi; and Inoue, Nobuyuki, 4,400,439, Cl. 428-478.200.
Institute of Gas Technology: *See*—
Banasiuk, Hubert A., 4,399,863, Cl. 165-9.000.
Instituut voor Bewaring en Verwerking van Landbouwprodukten: *See*—
Rijkens, Berend A., 4,400,195, Cl. 71-10.000.
Intel Corporation: *See*—
Gudger, Keith H., 4,400,799, Cl. 365-95.000.
International Business Machines Corporation: *See*—
Andrade, Thomas L., 4,400,636, Cl. 307-446.000.
Aviram, Ari; and Ellmann, Susan O., 4,400,100, Cl. 400-120.000.
Barbee, Steven G.; Leas, James M.; Lloyd, James R.; and Nagarajan, Arunachala, 4,400,715, Cl. 357-49.000.
Bauge, Michel G.; and Mollier, Pierre B., 4,400,713, Cl. 357-45.000.
Bazlen, Dieter; Bock, Dietrich W.; Getzlaff, Klaus J.; Hajdu, Johann; and Painke, Helmut, 4,400,776, Cl. 364-200.000.
Beebe, William E.; and Duff, Dean R., 4,400,753, Cl. 360-133.000.
Brown, Paul J.; Dugan, Robert J.; and Guyette, Richard R., 4,400,773, Cl. 364-200.000.
Bupp, James R.; and Maier, Lawrence R., 4,400,618, Cl. 250-302.000.
Chan, Shiu K.; Gerardi, John A.; and McGilvray, Bruce L., 4,400,770, Cl. 364-200.000.
Chevillat, Pierre R.; and Gfeller, Fritz, 4,400,616, Cl. 235-487.000.
Condas, George A.; and Doss, Saad K., 4,400,246, Cl. 204-58.000.
Dash, Somanath; Garnache, Richard R.; and Troutman, Ronald R., 4,399,605, Cl. 29-571.000.
Godsoe, Robert J.; and Wenner, Jack W., 4,399,959, Cl. 242-195.000.
McCray, Charles M.; and Grubbs, William A., 4,400,104, Cl. 400-320.000.
Rueger, William J., 4,399,936, Cl. 226-92.000.
Schuenemann, Claus, 4,400,793, Cl. 364-900.000.
Siverling, Michael M., 4,400,747, Cl. 360-77.000.
Thorne, William D., 4,399,748, Cl. 101-93.040.
International Coal Refining Company: *See*—
Givens, Edwin N.; and Ying, David H. S., 4,400,261, Cl. 208-8.0LE.
International Flavors & Fragrances Inc.: *See*—
Klemarczyk, Philip T.; Dekker, Lambert; and Kiwala, Jacob, 4,400,311, Cl. 252-522.00R.
Licciardello, Michael; Boden, Richard M.; Watkins, Hugh; and Hanna, Marie R., 4,400,290, Cl. 252-174.110.

Pittet, Alan O.; Muralidhara, Ranya; and Vock, Manfred H., 4,400,390, Cl. 424-301.000.
International Memories, Inc.: *See*—
Broyles, Douglas W.; and Palmer, Ronald S., 4,400,772, Cl. 364-200.000.
International Telephone and Telegraph Corporation: *See*—
Bartels, Leroy R.; Lawson, John H.; and King, Paul L., 4,399,890, Cl. 182-100.000.
Interox Chemicals Limited: *See*—
Haughey, Douglas P.; and Millar, Malcolm H., 4,399,633, Cl. 47-57.600.
Inui, Tomoyuki: *See*—
Takegami, Yoshinobu; Inui, Tomoyuki; Ishihara, Takayuki; Araki, Eiichi; and Kanie, Toshihiro, 4,400,328, Cl. 260-448.00C.
Iomega Corporation: *See*—
Bauck, Randall C.; Kleczkowski, S. Peter; and Radman, Anton J., 4,400,748, Cl. 360-99.000.
IPT Corporation: *See*—
Brown, M. Wayne, 4,399,795, Cl. 123-527.000.
Irie, Syouzi; and Hirakawa, Osamu, to Fujitsu Limited. Magnetic bubble memory device. 4,400,795, Cl. 365-1.000.
Iseki, Takeo, to Tomy Kogyo Co., Inc. Toy having plurality of parts capable of disengaging upon rotation. 4,399,632, Cl. 46-16.000.
Ishibashi, Kiyoshi, to Mitsubishi Denki Kabushiki Kaisha. Pressure sensor. 4,400,682, Cl. 338-4.000.
Ishiguro, Jiro; and Maruya, Kazuo, to Fukuvi Chemical Industry Co., Ltd. Process for the preparation of molding flexible graphite granules and a molded graphite product produced therefrom. 4,400,433, Cl. 428-408.000.
Ishihara, Takayuki: *See*—
Takegami, Yoshinobu; Inui, Tomoyuki; Ishihara, Takayuki; Araki, Eiichi; and Kanie, Toshihiro, 4,400,328, Cl. 260-448.00C.
Ishikawa, Masaaki; Ueda, Syuzo; and Imanaka, Makoto, to Kawasaki Steel Corporation. Cr-Mo Steel for use as very thick plates of 75 mm or more for oil refinery, coal liquefaction and coal gasification equipment. 4,400,225, Cl. 148-36.000.
Ishikawa, Masashi; Shimada, Masatoshi; Okamoto, Katsutomo; Sugita, Shigeyoshi; Goto, Masayuki; Koizumi, Yukuo; and Kaneda, Osamu, to Nippon Electric Co., Ltd. Corrosion monitoring system using a metal pipe for transmission of monitoring signals. 4,400,782, Cl. 364-481.000.
Ishikawa, Tadashi: *See*—
Ogihara, Musuo; Shinozaki, Nobuo; Ishikawa, Tadashi; and Seki, Yoichi, 4,400,091, Cl. 368-80.000.
Ishikawa, Toshio: *See*—
Takehira, Katsuomi; Ishikawa, Toshio; Hayakawa, Takashi; and Imamura, Juichi, 4,400,544, Cl. 568-360.000.
Isogai, Masato: *See*—
Nagae, Yoshiharu; Ito, Tetsuo; Kitajima, Masaaki; Kawakami, Hideaki; Nakano, Fumio; Abe, Hidetoshi; Isogai, Masato; Ooue, Michio; and Mukoh, Akio, 4,400,059, Cl. 350-332.000.
Isono, Masaru; Nunokawa, Kazuo; Kondo, Masayuki; and Takada, Shinzo, to Tokyo Kogaku Kikai Kabushiki Kaisha. Focus detecting device for opthalmologic instruments. 4,400,070, Cl. 354-25.000.
Ito, Tetsuo: *See*—
Nagae, Yoshiharu; Ito, Tetsuo; Kitajima, Masaaki; Kawakami, Hideaki; Nakano, Fumio; Abe, Hidetoshi; Isogai, Masato; Ooue, Michio; and Mukoh, Akio, 4,400,059, Cl. 350-332.000.
Ito, Zyouzi: *See*—
Takahashi, Yoshinobu; Tokushima, Yasuo; Ogata, Kentarou; Suzuki, Mamoru; and Ito, Zyouzi, 4,400,416, Cl. 427-434.500.
Itoh, Satoru: *See*—
Arai, Yoshio; Kataoka, Hiroyuki; Suzuki, Isao; and Itoh, Satoru, 4,400,737, Cl. 358-263.000.
Itoh, Testuro; Oizumi, Toshiro; and Yamada, Shigeo, to Mitsubishi Denki Kabushiki Kaisha. Method and apparatus for discharge machining polygonal contours. 4,400,606, Cl. 219-69.00M.
Itoh, Yutaka: *See*—
Takahashi, Akio; Itoh, Yutaka; Shimazaki, Takeshi; Wajima, Motoyo; Morishita, Hirosada; Mizuno, Yutaka; Yokozawa, Shunya; and Tsukanishi, Kenji, 4,400,438, Cl. 428-458.000.
ITT Industries, Inc.: *See*—
Flamm, Peter M., 4,400,693, Cl. 340-347.0AD.
Jandl, Erwin; and Prang, Josef-Elmar, 4,400,598, Cl. 200-16.00D.
Ivarsson, Lennart P.; and Blom, Ingvar G. A., to Hoganas AB. Process for repairing refractory linings. 4,400,335, Cl. 264-30.000.
Ive, John G. S., to Sony Corporation. Processing binary data. 4,400,810, Cl. 371-40.000.
Iwai, Tomio, to Yamaha Hatsudoki Kabushiki Kaisha; and Shanshin Kogyo Kabushiki Kaisha. Intake heating system for outboard engine. 4,399,797, Cl. 123-552.000.
Iwanami, Eiichi, to Kabushiki Kaisha Daini Seikosha. Read only memory using static induction transistor. 4,400,797, Cl. 365-174.000.
Iwata, Riso; and Wada, Akira, to Nippon Zeon Co. Ltd. Acrylic adhesive composition containing cyclopentadiene resin. 4,400,486, Cl. 525-57.000.
Iyer, Shankar S., to Southland Corporation, The. Process for preparing bis-(diphenylsulfoniophenyl)-sulfide bis-chloride. 4,400,541, Cl. 568-56.000.
Izu, Masatsugu; Cannella, Vincent D.; and Ovshinsky, Stanford R., to Energy Conversion Devices, Inc. Method of making p-doped silicon films. 4,400,409, Cl. 427-39.000.
Izumi, Masayuki; and Takeda, Renzo, to Hitachi, Ltd. System and method for controlling operation of boiling water reactor. 4,400,343, Cl. 376-417.000.
Izumi, Shuji; Sahara, Masayoshi; and Nakai, Masaaki, to Minolta Camera Kabushiki Kaisha. Analog-to-digital converter for cameras. 4,400,691, Cl. 340-347.0AD.
Izumi, Toshiaki; Maruta, Fumio; Kobuke, Takayoshi; and Noguchi, Kiyoshi, to TDK Electronics Co., Ltd. Magnetic recording media and process of producing them. 4,400,444, Cl. 428-694.000.
Izzi, Lewis B., Sr., to Plastic Oddities, Inc. Vent pipe cap. 4,399,743, Cl. 98-122.000.
J. M. Voith GmbH: *See*—
Schiel, Christian; and Wolf, Robert, 4,399,747, Cl. 100-162.00B.
Jackel, Janet L.: *See*—
Alferness, Rodney C.; and Jackel, Janet L., 4,400,052, Cl. 350-96.120.
Jackson, Joshua M.; and Koval, Vernon E., to NL Sperry Sun, Inc. Continuous borehole telemetry system and method. 4,399,877, Cl. 175-45.000.
Jacobs, John J., to Carrier Corporation. Motor compressor unit. 4,399,669, Cl. 62-469.000.
Jacobs Manufacturing Company, The: *See*—
Cavanagh, Mark S., 4,399,787, Cl. 123-321.000.
Jacobson, Earl B., to Nuclear Power Outfitters. Radiation attenuation system. 4,400,623, Cl. 250-517.100.
Jacobson, Sava. Incoming audio detection circuit for a speaker telephone. 4,400,581, Cl. 179-1.0HF.
Jade Corporation: *See*—
Brown, Don B., 4,400,714, Cl. 357-70.000.
Jalfre, Naurice: *See*—
Kaplan, Jean-Pierre; Jalfre, Naurice; and Giudicelli, Don P., 4,400,394, Cl. 424-319.000.
James River-Dixie/Northern, Inc.: *See*—
Lawrence, William J.; and Halferty, Patrick W., 4,400,148, Cl. 425-155.000.
Jandl, Erwin; and Prang, Josef-Elmar, to ITT Industries, Inc. Slider switch. 4,400,598, Cl. 200-16.00D.
Janler Corporation: *See*—
Klingler, Josef F., 4,399,928, Cl. 220-335.000.
Janome Sewing Machine Co. Ltd.: *See*—
Hanyu, Susumu, 4,399,762, Cl. 112-259.000.
Janssen, Wladimir. Shive analyzer. 4,399,691, Cl. 73-63.000.
Jansson, Elis, to Humble, Olle. Telescoping measuring rule. 4,399,616, Cl. 33-161.000.
Jarvis, Jack D., to Aluma-Form, Inc. Hand float. 4,399,583, Cl. 15-235.800.
Jaunin, Jean-Pierre, to OMEGA Louis Brandt & Frere S.A. Method for inspecting the running of a timepiece and timepiece adapted for such method. 4,400,093, Cl. 368-200.000.
Jautelat, Manfred; Arlt, Dieter; Lantzsch, Reinhard; Fuchs, Rainer; Riebel, Hans-Jochem; Schroder, Rolf; and Harnisch, Horst, to Bayer Aktiengesellschaft. Process for the preparation of styryl-cyclopropanecarboxylic acid esters and new intermediate products for this process. 4,400,523, Cl. 549-320.000.
Jedlicka, Byrl A. Wrench. 4,399,721, Cl. 81-57.460.
Jeffreys, Dennis C.: *See*—
Johnston, Reed H.; Jeffreys, Dennis C.; Stratton, Lawrence J.; and Welz, Albert W., Jr., 4,400,688, Cl. 340-310.00R.
Jennings, Daniel E.; and Woodling, Richard S. Simulated space helmet. 4,400,591, Cl. 179-156.00R.
Jensen, Harbo P., to Chevron Research Company. Method of and apparatus for charging ground hydrocarbonaceous material to a pressurized gasification system. 4,400,125, Cl. 414-187.000.
Jenson, Jerry: *See*—
Damratowski, Harold; and Jenson, Jerry, 4,399,914, Cl. 206-533.000.
Jeppsson, Jan: *See*—
Erdmann, Joachim C.; Gellert, Robert I.; and Jeppsson, Jan, 4,399,675, Cl. 72-37.000.
Jessen, P. Jay: *See*—
Crudden, Eric H.; and Jessen, P. Jay, 4,399,966, Cl. 244-129.400.
Jessup, Peter; Holstedt, Richard A.; and Baron, Kenneth, to Union Oil Company of California. Boron derivatives as lubricant additives. 4,400,284, Cl. 252-49.600.
Jibiki, Hiroshi: *See*—
Fukui, Kiyoshi; Kakeya, Noboru; Jibiki, Hiroshi; and Matsuo, Fumio, 4,400,508, Cl. 544-313.000.
Jidosha Kiki Co., Ltd.: *See*—
Masuda, Naosuke; Suzuki, Yoshio; and Ohe, Takeshi, 4,400,139, Cl. 417-304.000.
Jiruse, Jaroslav, to ZVS Adamovske strojirny, Koncernovy podnik. Universal sucker. 4,399,990, Cl. 271-90.000.
Joffe, Edward J. One-piece spectacle with hinge. 4,400,067, Cl. 351-59.000.
Johal, Sarjit S. Preparation and crystallization of Fraction I protein from plant sources. 4,400,471, Cl. 435-232.000.
Johansson, Hans A. V. Seat of a patient-lifting devices. 4,399,372, Cl. 5-81.00R.
Johns, Robert H., to Allegheny Ludlum Steel Corporation. Apparatus for strip casting. 4,399,860, Cl. 164-423.000.
Johnson, Bruce F.: *See*—
Southworth, Glen R.; McClelland, Larry R.; and Johnson, Bruce F., 4,400,717, Cl. 358-13.000.
Johnson, Marvin M.; and Tabler, Donald C., to Phillips Petroleum Company. Separation of monoolefins from diolefins. 4,400,564, Cl. 585-845.000.
Johnson, Michael R., to Pfizer Inc. 9-Hydroxyoctahydrobenzo [c]quinolines, analgesic compositions containing them and processes for producing analgesia with them. 4,400,385, Cl. 424-258.000.

Johnson, Raynor A.; and Barrow, Ralph M., Jr., to American Industrial Research. Flexible film air pallet for material movement. 4,399,885, Cl. 180-125.000.

Johnson, Reynold B. Dual layer record element and method. 4,400,457, Cl. 430-140.000.

Johnston, Reed H.; Jeffreys, Dennis C.; Stratton, Lawrence J.; and Welz, Albert W., Jr., to New England Power Service Company. Method and apparatus for communication over electric power lines. 4,400,688, Cl. 340-310.00R.

Johnston, Russell A.: *See—*
Adkins, Joel E.; Stout, Gregg W.; and Johnston, Russell A., 4,399,871, Cl. 166-325.000.

Jones, Addison B., to Rockwell International Corporation. Method for deposition of thin film alloys utilizing electron beam vaporization. 4,400,407, Cl. 427-8.000.

Jones, C. David: *See—*
Suarez, Tulio; and Jones, C. David, 4,400,543, Cl. 568-327.000.

Jones, George R. Pseudo-DC restore application to staring array detectors. 4,400,729, Cl. 358-113.000.

Jorgensen, Karl G.; Magnusson, Leif L.; and Olsson, Curt S., to Sikob Svensk Industris Konstruktions-Och Berakningskontor AB. Method of bundling brushwood. 4,399,745, Cl. 100-2.000.

Jorkasky, Richard J., II: *See—*
Giddings, Brandford E.; Jorkasky, Richard J., II; and Thornton, Kim L., 4,400,484, Cl. 524-296.000.

Joy Manufacturing Company: *See—*
Goodboy, George O., Jr., 4,399,837, Cl. 137-614.110.

Joyce, Tom B., to Pokorny, Louis, Jr.; and Pokorny, John M. Folding bed frame structure for sofa beds or the like. 4,399,571, Cl. 5-13.000.

Juffa, Richard: *See—*
Springer, Carl M.; Theis, Bernd O.; Wawra, Georg; and Juffa, Richard, 4,400,147, Cl. 418-206.000.

Jungverdorben, Hermann J.: *See—*
Reinehr, Ulrich; Herbertz, Toni; Jungverdorben, Hermann J.; and Dross, Joachim, 4,400,339, Cl. 264-206.000.

Jurash, Oleg G.: *See—*
Vishnevsky, Vladimir S.; Koval, Vitaly S.; Lavrinenko, Vyacheslav V.; Boichenko, Oleg L.; Kartashev, Igor A.; Golovyashin, Jury V.; Serov, Nikolai F.; Shinkarenko, Leonid I.; and Jurash, Oleg G., 4,400,641, Cl. 310-323.000.

Jurgens, Kenneth C., Jr.: *See—*
Abernathy, Marshall W., Jr.; and Jurgens, Kenneth C., Jr., 4,400,493, Cl. 526-68.000.

Jurgensen, David J.; and Landsman, Howard A., to Tektronix, Inc. Multiburst signal generation. 4,400,730, Cl. 358-139.000.

Jurriens, Theodorus K.: *See—*
Bruynes, Cornelis A.; and Jurriens, Theodorus K., 4,400,509, Cl. 544-315.000.

Kabushiki Kaisha Daini Seikosha: *See—*
Iwanami, Eiichi, 4,400,797, Cl. 365-174.000.

Kabushiki Kaisha Ishida Koko Seisakusho: *See—*
Konishi, Satoshi, 4,399,880, Cl. 177-1.000.

Kabushiki Kaisha Kobe Seiko Sho: *See—*
Noyori, Tatsuhiko; Ueda, Masakazu; Aoki, Masanobu; Kajima, Takashi; and Masuda, Tsuneharu, 4,399,676, Cl. 72-40.000.

Kabushiki Kaisha Komatsu Seisakusho: *See—*
Ogata, Yasuhiro, 4,400,039, Cl. 303-3.000.

Kabushiki Kaisha Mitutoyo Seisakusho: *See—*
Nishikata, Goro; and Shibukawa, Kozo, 4,399,613, Cl. 33-143.00M.

Kabushiki, Kaisha Suwa Seikosha: *See—*
Takeda, Koji; Akahane, Masao; and Takayama, Chitoshi, 4,400,582, Cl. 179-1.0SM.

Kabushiki Kaisha Toyota Chuo Kenkyusho: *See—*
Arai, Tohru; Fujita, Hironori; and Takada, Yasuo, 4,400,224, Cl. 148-15.000.

Kadoi, Noriaki: *See—*
Tanaka, Takayuki; Kadoi, Noriaki; and Yoshimoto, Akio, 4,399,775, Cl. 123-41.080.

Kadowaki, Satoshi: *See—*
Wakou, Susumu; and Kadowaki, Satoshi, 4,400,607, Cl. 219-86.800.

Kafer, Peter; Morbitzer, Leo; Nouvertne, Werner; and Neuray, Dieter, to Bayer Aktiengesellschaft. Copolyester carbonates and the admixture thereof with known polycarbonates to give thermoplastic moulding compositions. 4,400,491, Cl. 525-439.000.

Kai, Junjiro: *See—*
Kimura, Hiroshi; and Kai, Junjiro, 4,400,287, Cl. 252-70.000.

Kajima, Takashi: *See—*
Noyori, Tatsuhiko; Ueda, Masakazu; Aoki, Masanobu; Kajima, Takashi; and Masuda, Tsuneharu, 4,399,676, Cl. 72-40.000.

Kakeya, Noboru: *See—*
Fukui, Kiyoshi; Kakeya, Noboru; Jibiki, Hiroshi; and Matsuo, Fumio, 4,400,508, Cl. 544-313.000.

Kaku, Toshimitsu: *See—*
Mitsuya, Munehisa; Terao, Motoyasu; Ota, Sakae; Taniguchi, Yoshio; Kaku, Toshimitsu; and Horigome, Shinkichi, 4,400,707, Cl. 346-135.100.

Kalaus, Gyorgy: *See—*
Szantay, Csaba; Szabo, Lajos; Kalaus, Gyorgy; Dancsi, Lajos; Keve, Tibor; Drexler, Ferenc; and Mihalyfi, Krisztina, 4,400,514, Cl. 546-51.000.

Kalennikov, Evgeny A.: *See—*
Shutov, Gennady M.; Erdman, Maiya E.; Solomakha, Adel I.; and Kalennikov, Evgeny A., 4,400,495, Cl. 524-176.000.

Kalish, Norman S.: *See—*
Trimarco, Emil P.; and Kalish, Norman S., 4,399,975, Cl. 248-678.000.

Kaman, Richard A.; Felix, Kenneth A.; Smanski, Philip J.; and Haug, John R., to Motorola, Inc. Method and apparatus for automatically attempting to seize a radio channel in a multichannel communication system. 4,400,585, Cl. 179-2.0EB.

Kamimura, Teturo; Komatsubara, Masahiro; Ando, Shizuo; Inanaga, Takuzi; and Takahashi, Akira, to Pioneer Electronic Corporation. Cassette tape player. 4,400,744, Cl. 360-69.000.

Kaminow, Ivan P., to Bell Telephone Laboratories, Incorporated. Crenelated-ridge waveguide laser. 4,400,813, Cl. 372-45.000.

Kaminski, Joan M.: *See—*
Horodysky, Andrew G.; and Kaminski, Joan M., 4,400,283, Cl. 252-32.70E.

Kamite, Junji: *See—*
Kobayashi, Kazuo; Tanaka, Hideki; Iida, Katsuyoshi; and Kamite, Junji, 4,399,791, Cl. 123-489.000.

Kanamori, Hiroshi; and Kanazawa, Takeshi, to Nissan Motor Co., Ltd. Mounting of tiltable ornaments on motor vehicles. 4,400,417, Cl. 428-31.000.

Kanazawa, Takeshi: *See—*
Kanamori, Hiroshi; and Kanazawa, Takeshi, 4,400,417, Cl. 428-31.000.

Kaneda, Osamu: *See—*
Ishikawa, Masashi; Shimada, Masatoshi; Okamoto, Katsutomo; Sugita, Shigeyoshi; Goto, Masayuki; Koizumi, Yukuo; and Kaneda, Osamu, 4,400,782, Cl. 364-481.000.

Kaneda, Saburo; Matsumura, Naomi; Ikegami, Fujio; Shimizu, Kazuyuki; and Ikuta, Yukichi, to Fujitsu Limited. Virtual machine system. 4,400,769, Cl. 364-200.000.

Kaneko, Kenji: *See—*
Watanabe, Yasuaki; and Kaneko, Kenji, 4,400,732, Cl. 358-147.000.

Kanie, Toshihiro: *See—*
Takegami, Yoshinobu; Inui, Tomoyuki; Ishihara, Takayuki; Araki, Eiichi; and Kanie, Toshihiro, 4,400,328, Cl. 260-448.00C.

Kanner, Bernard; Schilling, Curtis L., Jr.; and Hopper, Steven P., to Union Carbide Corporation. Hydrogen bearing silyl carbamates. 4,400,526, Cl. 556-420.000.

Kano, Atsushi: *See—*
Kozuka, Nobuhiko; Yamagata, Ryutaro; Koyama, Shigeo; Sakata, Hiromi; and Kano, Atsushi, 4,400,077, Cl. 355-3.0DR.

Kanzaki Paper Mfg. Co., Ltd.: *See—*
Oeda, Yoshitaka, 4,400,437, Cl. 428-447.000.

Kaplan, Jean-Pierre; Jalfre, Naurice; and Giudicelli, Don P., to Synthelabo. Benzylidene derivatives. 4,400,394, Cl. 424-319.000.

Kaplan, Jean-Pierre; and Raizon, Bernard, to Synthelabo. Benzylidene derivatives. 4,400,536, Cl. 564-269.000.

Karasawa, Yoshio: *See—*
Shickawa, Takayasu; and Karasawa, Yoshio, 4,400,703, Cl. 343-895.000.

Karashima, Masashi. Refrigerated showcase. 4,400,046, Cl. 312-236.000.

Karl Mayer Textilmaschinenfabrik GmbH: *See—*
Hittel, Gerhard; Fiedler, Hand; and Groh, Hans, 4,399,670, Cl. 66-84.00A.

Karl Thomae Gesellschaft mit beschrankter Haftung: *See—*
Innemee, Hendricus C.; van Meel, Jacobus C. A.; De Jonge, Adriaan; Timmermans, Petrus B. M. W. M.; and van Zwieten, Pieter A., 4,400,378, Cl. 424-244.000.

Karlsson, Birger K. L. Torque transmitting device. 4,399,716, Cl. 74-125.500.

Karlsson, Harry L.; and Norlander, Lars G., to Sandvik Aktiebolag; and Aktiebolaget SKF. Lubricating device. 4,399,878, Cl. 175-227.000.

Karmelkorn Shoppes, Inc.: *See—*
Tunick, Abraham L., 4,399,939, Cl. 229-52.00B.

Kaross, Klaus: *See—*
Hans-Jurgen, Busack; Kaross, Klaus; and Rinne, Helmut, 4,400,258, Cl. 204-415.000.

Kart, Warren E.: *See—*
Toffolon, Roger L.; and Kart, Warren E., 4,400,149, Cl. 425-262.000.

Kartashev, Igor A.: *See—*
Vishnevsky, Vladimir S.; Koval, Vitaly S.; Lavrinenko, Vyacheslav V.; Boichenko, Oleg L.; Kartashev, Igor A.; Golovyashin, Jury V.; Serov, Nikolai F.; Shinkarenko, Leonid I.; and Jurash, Oleg G., 4,400,641, Cl. 310-323.000.

Kashiwagi, Takashi; and Inoue, Nobuyuki, to Process Shizai Co., Ltd. Recording media. 4,400,439, Cl. 428-478.200.

Kass, Lawrence. Metachromatic dye sorption means for differential determination of leukocytes. 4,400,370, Cl. 424-3.000.

Katagiri, Masatake: *See—*
Konishi, Shin; Yoshida, Mitsuhiro; Katagiri, Masatake; Somezawa, Masashi; Ninomiya, Yoshinobu; and Hashimoto, Akira, 4,400,498, Cl. 528-60.000.

Katagiri, Masayoshi; Ogura, Osamu; and Fujii, Takashi, to Toyota Jidosha Kogyo Kabushiki Kaisha; and Aisin Seiki Kabushiki Kaisha. Brake booster. 4,399,735, Cl. 91-369.00B.

Kataoka, Hiroyuki: *See—*
Arai, Yoshio; Kataoka, Hiroyuki; Suzuki, Isao; and Itoh, Satoru, 4,400,737, Cl. 358-263.000.

Kataoka, Ryuji, to Fuji Jukogyo Kabushiki Kaisha; and Nissan Motor Co., Ltd. Air-fuel ratio control system. 4,399,790, Cl. 123-440.000.

Kato, Akihiko: *See—*
Osumi, Yasuaki; Suzuki, Hiroshi; Kato, Akihiko; Oguro, Keisuke; and Nakane, Masanori, 4,400,348, Cl. 420-443.000.

Kato, Hisaaki, to Murata Kikai Kabushiki Kaisha. Method for evaluation of balloons of yarn-like products. 4,399,648, Cl. 57-265.000.

Kato, Keigo; Ando, Masahisa; and Kuroiwa, Yosio, to Toyota Jidosha Kabushiki Kaisha. Intake heating device of an internal combustion engine. 4,399,796, Cl. 123-549.000.

Katsube, Junki: *See*—
Sami, Shunsuke; Sugie, Akihiko; Ono, Keiichi; Kawakami, Hajime; Kojima, Atsuyuki; and Katsube, Junki, 4,400,393, Cl. 424-305.000.

Katsuma, Makoto: *See*—
Miura, Yuzo; Katsuma, Makoto; and Suzuki, Masayuki, 4,400,076, Cl. 354-202.000.

Katsuragi, Shigeo; Morita, Kaoru; Kobari, Sadami; Noda, Toshiharu; Nakagawa, Nobuaki; and Watanabe, Susumu, to Toyo Jozo Kabushiki Kaisha. C-Terminal fragment of human chorionic gonadotropin. 4,400,316, Cl. 260-112.50R.

Kawabe, Ushio: *See*—
Taguchi, Sadanori; Honda, Yukio; Aida, Toshiyuki; and Kawabe, Ushio, 4,400,648, Cl. 313-346.00R.

Kawaguchi, Munetaka: *See*—
Miyake, Masayoshi; Ueoka, Isao; and Kawaguchi, Munetaka, 4,400,430, Cl. 428-383.000.

Kawai, Hisasi: *See*—
Kohama, Tokio; Obayashi, Hideki; Kawai, Hisasi; and Egami, Tsuneyuki, 4,399,697, Cl. 73-204.000.

Kawai, Mituo: *See*—
Aisaka, Tatsuyoshi; Kawai, Mituo; Hasegawa, Suteto; and Nawai, Takeo, 4,400,346, Cl. 376-327.000.

Kawakami, Hajime: *See*—
Sami, Shunsuke; Sugie, Akihiko; Ono, Keiichi; Kawakami, Hajime; Kojima, Atsuyuki; and Katsube, Junki, 4,400,393, Cl. 424-305.000.

Kawakami, Hideaki: *See*—
Nagae, Yoshiharu; Ito, Tetsuo; Kitajima, Masaaki; Kawakami, Hideaki; Nakano, Fumio; Abe, Hidetoshi; Isogai, Masato; Ooue, Michio; and Mukoh, Akio, 4,400,059, Cl. 350-332.000.

Kawamata, Motoo: *See*—
Oba, Masayuki; Kawamata, Motoo; Tsuboi, Hikotada; and Koga, Nobuhito, 4,400,521, Cl. 548-549.000.

Kawasaki, Mikio: *See*—
Ono, Kouzi; Kawasaki, Mikio; Natori, Mariko; and Sakamoto, Eiichi, 4,400,462, Cl. 430-415.000.

Kawasaki Steel Corporation: *See*—
Ishikawa, Masaaki; Ueda, Syuzo; and Imanaka, Makoto, 4,400,225, Cl. 148-36.000.
Kondo, Mikio, 4,400,206, Cl. 75-41.000.

Kawashima, Saburo: *See*—
Asano, Makoto; Kawashima, Saburo; Tanabe, Yoshimitu; and Murakami, Hisamichi, 4,400,492, Cl. 525-506.000.

Kawashima, Yutaka: *See*—
Hiromasa, Syunichiro; Omori, Norio; Kawashima, Yutaka; and Muto, Yukio, 4,399,698, Cl. 73-204.000.

Kazkaz, Ghaffar. Optical fiber coupler. 4,400,053, Cl. 350-96.150.

Keene, Douglas L.: *See*—
Traino, James C.; Micco, Felice A.; and Keene, Douglas L., 4,400,740, Cl. 358-293.000.

Keim, Karl-Heinz; and Korff, Joachim, to Union Rheinische Braunkohlen Kraftstoff Aktiengesellschaft. Process for the production of acetaldehyde and ethanol. 4,400,551, Cl. 568-487.000.

Keller, Margaret S.; and Brendle, Ralph N., to Milliken Research Corporation. Alkyleneoxy fugitive tints containing a 2-amino, 6-methoxy benzathiazole group and process for preparing such fugitive tints. 4,400,320, Cl. 260-158.000.

Keller, Russell D. Pressure tank connector. 4,400,020, Cl. 285-204.000.

Kelley, Everett J.; and Ilenda, Casmir S., to Rohm and Haas Company. Polyaminoester thermosetting resins. 4,400,500, Cl. 528-345.000.

Kelly, Stephen M.: *See*—
Carr, Neil; Gray, George W.; and Kelly, Stephen M., 4,400,061, Cl. 350-350.000.

Kelsey-Hayes Company: *See*—
Tribe, Leonard T., 4,399,894, Cl. 188-71.900.

Kennedy, Richard B., to Crehan, Patrick James; and Fricke, Richard J. Polyurethane foams and processes for preparation. 4,400,475, Cl. 521-103.000.

Kent, Anthony J.: *See*—
Lacey, Stephen J.; Wardle, Frank P.; Walford, Thomas L. H.; Knight, Samuel H.; Kent, Anthony J.; and Sharman, Kenneth E., 4,400,098, Cl. 384-99.000.

Kenyon, Bruce A., to Boeing Company, The. Low backscatter illumination system. 4,400,764, Cl. 362-263.000.

Kernforschungsanlage Julich GmbH: *See*—
Bechthold, Paul S.; and Chatzipetros, Johann, 4,399,689, Cl. 73-24.000.

Kernforschungszentrum Karlsruhe GmbH: *See*—
Henrich, Edmund; Hufner, Reinhold; and Weirich, Friedhelm, 4,400,183, Cl. 55-44.000.
Kiefer, Hans; and Rober, Hans-Gerd, 4,400,621, Cl. 250-385.000.

Kertz, Charles W., to Kertz, Charles W. Horseshoe measuring device. 4,399,614, Cl. 33-149.00R.

Kessler, John R., to Monarch Marking Systems, Inc. Ink roller assembly with capillary ink supply. 4,399,751, Cl. 101-348.000.

Kessler, Richard B.; and Nobel, Fred I., to Lea Ronal, Inc. Process for nickel plating aluminum and aluminum alloys. 4,400,415, Cl. 427-305.000.

Keve, Tibor: *See*—
Szantay, Csaba; Szabo, Lajos; Kalaus, Gyorgy; Dancsi, Lajos; Keve, Tibor; Drexler, Ferenc; and Mihalyfi, Krisztina, 4,400,514, Cl. 546-51.000.

Keystone Engineering Company: *See*—
Fritz, Conrad M., 4,400,042, Cl. 308-227.000.

Keystone International, Inc.: *See*—
Holtgraver, Edward G., 4,399,833, Cl. 137-315.000.

Khosrovi, Behzad: *See*—
Bauer, Keith A.; and Khosrovi, Behzad, 4,400,467, Cl. 435-104.000.

Kiba, Akira, to Minolta Camera Kabushiki Kaisha. Cleaning apparatus. 4,400,082, Cl. 355-15.000.

Kible, Dieter, to Hewlett-Packard GmbH. Read/write circuit for a random access memory. 4,400,801, Cl. 365-195.000.

Kidd, Patrick D.: *See*—
Orlowski, Jan A.; Butler, David V.; and Kidd, Patrick D., 4,400,159, Cl. 433-202.000.

Kiddo Consumer Durables Corporation: *See*—
Gilman, Lester J., 4,400,673, Cl. 337-380.000.

Kiefer, Hans; and Rober, Hans-Gerd, to Kernforschungszentrum Karlsruhe GmbH. Detector device. 4,400,621, Cl. 250-385.000.

Kienlen, Loren C.; and McDonell, Thomas L. Panel insulation apparatus. 4,399,805, Cl. 126-121.000.

Kievsky Politekhnichesky Institut: *See*—
Vishnevsky, Vladimir S.; Koval, Vitaly S.; Lavrinenko, Vyacheslav V.; Boichenko, Oleg L.; Kartashev, Igor A.; Golovyashin, Jury V.; Serov, Nikolai F.; Shinkarenko, Leonid I.; and Jurash, Oleg G., 4,400,641, Cl. 310-323.000.

Killop, James T., to Anderson-Cook, Inc. Rack for splining thin-wall sleeves of power transmission members. 4,399,678, Cl. 72-88.000.

Kimber, Barbara M.: *See*—
Boocock, Denis; and Kimber, Barbara M., 4,400,298, Cl. 252-400.00R.

Kimura, Hiroshi; and Kai, Junjiro, to Mitsubishi Denki Kabushiki Kaisha. Heat storage material. 4,400,287, Cl. 252-70.000.

Kindlund, Alf R.; and Lundstrom, Kurt I., to Engstrom Medical AB. Gas detector. 4,399,686, Cl. 73-23.000.

King, Paul L.: *See*—
Bartels, Leroy R.; Lawson, John H.; and King, Paul L., 4,399,890, Cl. 182-100.000.

King, Roderick V., to Ethyl Products Company. Method and apparatus for threading closures. 4,399,679, Cl. 72-117.000.

Kioritz Corporation: *See*—
Kondo, Tadasige; Ono, Susumu; and Takata, Kenichi, 4,399,801, Cl. 123-603.000.

Kiraly, Louis J., to United States of America, National Aeronautics and Space Administration. Piezoelectric composite materials. 4,400,642, Cl. 310-332.000.

Kishimoto, Mikio: *See*—
Hayashi, Yukihiro; Sueyoshi, Toshinobu; Hirai, Shigeo; Kishimoto, Mikio; Tashita, Katsunori; and Amemiya, Masahiro, 4,400,337, Cl. 264-82.000.

Kisner, Howard D., to General Motors Corporation. Control of electron bombardment of the exhaust oxygen sensor during electrode sputtering. 4,400,255, Cl. 204-192.0SP.

Kitado, Haruo, to Epson Corporation. Dot matrix printer with compressed character data storage. 4,400,791, Cl. 364-900.000.

Kitajima, Masaaki: *See*—
Nagae, Yoshiharu; Ito, Tetsuo; Kitajima, Masaaki; Kawakami, Hideaki; Nakano, Fumio; Abe, Hidetoshi; Isogai, Masato; Ooue, Michio; and Mukoh, Akio, 4,400,059, Cl. 350-332.000.

Kiwala, Jacob: *See*—
Klemarczyk, Philip T.; Dekker, Lambert; and Kiwala, Jacob, 4,400,311, Cl. 252-522.00R.

Klar, Heinrich; and Roessler, Berward, to Siemens Aktiengesellschaft. Integrator with sampling stage. 4,400,637, Cl. 307-497.000.

Klaus, Andrae: *See*—
Hutschenreuter, Elfriede; and Klaus, Andrae, 4,399,839, Cl. 138-118.100.

Klausz, Remy: *See*—
Bens, Jean; Bloch, Marcel; Chekroun, Rene; and Klausz, Remy, 4,400,819, Cl. 378-20.000.

Kleber, Carl J.: *See*—
Muhler, Joseph C.; Kleber, Carl J.; Ream, Ronald L.; and Moore, David M., 4,400,372, Cl. 424-48.000.

Kleczkowski, S. Peter: *See*—
Bauck, Randall C.; Kleczkowski, S. Peter; and Radman, Anton J., 4,400,748, Cl. 360-99.000.

Klein, Gerald L., to Beckman Instruments, Inc. Method and apparatus ensuring full volume pickup in an automated pipette. 4,399,711, Cl. 73-864.160.

Klein, Reto, to BBC Brown, Boveri & Company, Limited. Method for periodic digital to analog conversion. 4,400,692, Cl. 340-347.0DA.

Kleinschmidt, Walter J.: *See*—
Douthart, Richard J.; Kleinschmidt, Walter J.; and Schultz, Richard M., 4,400,375, Cl. 424-85.000.

Klemarczyk, Philip T.; Dekker, Lambert; and Kiwala, Jacob, to International Flavors & Fragrances Inc. Substituted methyl isopropyl cyclohexenones, organoleptic uses thereof and process for preparing same. 4,400,311, Cl. 252-522.00R.

Klimenko, Vladimir I.: *See*—
Mamadzhanov, Ulmas D.; Bakhir, Vitold M.; Klimenko, Vladimir I.; Alekhin, Stanislav A.; and Zadorozhny, Jury G., 4,400,266, Cl. 209-130.000.

Klingensmith, Robert R. Animal actuated attention attracting apparatus. 4,400,696, Cl. 340-573.000.

Klingler, Josef F., to Janler Corporation. Closure cap. 4,399,928, Cl. 220-335.000.

Klootwyk, Ronald I.: *See—*
Gentry, Larry L.; and Klootwyk, Ronald I., 4,400,109, Cl. 405-195.000.

Klosiewicz, Daniel W., to Hercules Incorporated. Method for making a dicyclopentadiene thermoset polymer. 4,400,340, Cl. 264-328.600.

Knight, Samuel H.: *See—*
Lacey, Stephen J.; Wardle, Frank P.; Walford, Thomas L. H.; Knight, Samuel H.; Kent, Anthony J.; and Sharman, Kenneth E., 4,400,098, Cl. 384-99.000.

Knoblauch, Karl: *See—*
Grochowski, Horst; and Knoblauch, Karl, 4,400,363, Cl. 423-239.000.

Knowles, Albert H.; and Rines, Robert H. Process and apparatus for fish growth acceleration. 4,399,770, Cl. 119-3.000.

Knuth, Manfred: *See—*
Coenen, Hubert; Hagen, Rainer; and Knuth, Manfred, 4,400,398, Cl. 426-429.000.

Kobari, Sadami: *See—*
Katsuragi, Shigeo; Morita, Kaoru; Kobari, Sadami; Noda, Toshiharu; Nakagawa, Nobuaki; and Watanabe, Susumu, 4,400,316, Cl. 260-112.50R.

Kobayashi, Hiroaki: *See—*
Hatada, Kenji; Yokura, Miyoshi; and Kobayashi, Hiroaki, 4,400,424, Cl. 428-212.000.

Kobayashi, Junichi; Mifune, Takao; and Tanabe, Shoji, to Hitachi, Ltd. Rotor core of electric rotary machine. 4,400,639, Cl. 310-215.000.

Kobayashi, Kazuo; Tanaka, Hideki; Iida, Katsuyoshi; and Kamite, Junji, to Toyo Kogyo Co., Ltd. Air-fuel mixture control for automobile engine having fuel injection system. 4,399,791, Cl. 123-489.000.

Kobayashi, Nobuo: *See—*
Akiyama, Kazuhiko; Yoshino, Takeshi; Shiina, Michihiro; Sato, Shigeo; Nishizawa, Tetsuo; Yoshida, Toshio; and Kobayashi, Nobuo, 4,400,074, Cl. 354-173.000.

Kobayashi, Tetuo; and Hagiwara, Noboru, to Nippon Cable System Inc. Stroke self-adjusting mechanism for a control cable. 4,399,901, Cl. 192-111.00A.

Kobayashi, Yutaka: *See—*
Yokoyama, Shigeo; Misumi, Teruyuki; Fujimoto, Einosuke; and Kobayashi, Yutaka, 4,400,199, Cl. 71-88.000.

Kobelt, Jacob. Power assist device for control system. 4,399,734, Cl. 91-1.000.

Kober, Harald. Method of manufacturing reinforced fibers for mineral structural materials, and a structural element of a fiber-reinforced mineral structural material. 4,400,217, Cl. 106-93.000.

Kober, Marvin; and Battaglia, Eugene, to O.K. Machine and Tool Corp. Component lead bending and crimping tool. 4,399,844, Cl. 140-106.000.

Kobuke, Takayoshi: *See—*
Izumi, Toshiaki; Maruta, Fumio; Kobuke, Takayoshi; and Noguchi, Kiyoshi, 4,400,444, Cl. 428-694.000.

Koch, Klaus; and Syrbius, Gerhard, to Hermann Berstorff Maschinenbau GmbH. Apparatus for the continuous manufacture of glucose containing products. 4,400,218, Cl. 127-1.000.

Kochem, Winfried, to Original Hanau Heraeus GmbH. Operating room light fixture with adjustable light pattern. 4,400,765, Cl. 362-277.000.

Koga, Nobuhito: *See—*
Oba, Masayuki; Kawamata, Motoo; Tsuboi, Hikotada; and Koga, Nobuhito, 4,400,521, Cl. 548-549.000.

Kohama, Tokio; Obayashi, Hideki; Kawai, Hisasi; and Egami, Tsuneyuki, to Nippon Soken, Inc. Gas flow measuring apparatus. 4,399,697, Cl. 73-204.000.

Koizumi, Yukuo: *See—*
Ishikawa, Masashi; Shimada, Masatoshi; Okamoto, Katsutomo; Sugita, Shigeyoshi; Goto, Masayuki; Koizumi, Yukuo; and Kaneda, Osamu, 4,400,782, Cl. 364-481.000.

Kojima, Akio: *See—*
Hashimoto, Mitsuru; Sakai, Kiyoshi; Ohta, Katsunari; and Kojima, Akio, 4,400,455, Cl. 430-59.000.

Kojima, Atsuyuki: *See—*
Sami, Shunsuke; Sugie, Akihiko; Ono, Keiichi; Kawakami, Hajime; Kojima, Atsuyuki; and Katsube, Junki, 4,400,393, Cl. 424-305.000.

Kojima, Keiichi: *See—*
Yamanouchi, Shosuke; and Kojima, Keiichi, 4,400,580, Cl. 174-102.05C.

Kojima, Koichi: *See—*
Morimoto, Masaaki; Kusakabe, Noboru; Kojima, Koichi; and Koyama, Eiichi, 4,399,853, Cl. 152-359.000.

Kokusai Denshin Denwa Kabushiki Kaisha: *See—*
Shiokawa, Takayasu; and Karasawa, Yoshio, 4,400,703, Cl. 343-895.000.

Koller, Gloria: *See—*
Spry, Robert H.; Spry, Robert R.; and Koller, Gloria, 4,399,973, Cl. 248-524.000.

Komatsubara, Masahiro: *See—*
Kamimura, Tetuo; Komatsubara, Masahiro; Ando, Shizuo; Inanaga, Takuzi; and Takahashi, Akira, 4,400,744, Cl. 360-69.000.

Komori, Shinichi; Shimanuki, Yasushi; and Suzuki, Isamu, to Mitsubishi Kinzoku Kabushiki Kaisha. High thermal resistance, high electric conductivity copper base alloy. 4,400,351, Cl. 420-489.000.

Kondo, Masayuki: *See—*
Isono, Masaru; Nunokawa, Kazuo; Kondo, Masayuki; and Takada, Shinzo, 4,400,070, Cl. 354-25.000.

Kondo, Mikio, to Kawasaki Steel Corporation. Process for estimating particle size segregation of burden layer in blast furnace top. 4,400,206, Cl. 75-41.000.

Kondo, Tadasige; Ono, Susumu; and Takata, Kenichi, to Kioritz Corporation. Overrun prevention ignition system with ignition angle retardation circuit. 4,399,801, Cl. 123-603.000.

Konig, Klaus: *See—*
Haas, Peter; Muller, Heinz; Seifert, Peter; Wagner, Kuno; Findeisen, Kurt; and Konig, Klaus, 4,400,331, Cl. 260-932.000.

Konishi, Satoshi, to Kabushiki Kaisha Ishida Koko Seisakusho. Combinatorial weighing system. 4,399,880, Cl. 177-1.000.

Konishi, Shin; Yoshida, Mitsuhiro; Katagiri, Masatake; Somezawa, Masashi; Ninomiya, Yoshinobu; and Hashimoto, Akira, to Sony Corporation; and Nippon Polyurethane Industry Co., Ltd. Thermoplastic polyurethane resins. 4,400,498, Cl. 528-60.000.

Konishiroku Photo Industry Co., Ltd.: *See—*
Nezu, Takao, 4,400,085, Cl. 355-76.000.
Ono, Kouzi; Kawasaki, Mikio; Natori, Mariko; and Sakamoto, Eiichi, 4,400,462, Cl. 430-415.000.

Konrad, William L., to United States of America, Navy. Driver for high power sonar systems. 4,400,804, Cl. 367-137.000.

Kontos, Nicholas G. Methods and apparatus for treating work pieces. 4,399,828, Cl. 134-65.000.

Koos, Larry W., to Burroughs Corporation. Memory mapping unit. 4,400,794, Cl. 364-900.000.

Kooy, Wayne J.: *See—*
Yeager, Thomas C.; Wood, Douglas E.; and Kooy, Wayne J., 4,400,105, Cl. 400-616.100.

Korff, Joachim: *See—*
Fremery, Max; and Korff, Joachim, 4,400,557, Cl. 568-804.000.
Keim, Karl-Heinz; and Korff, Joachim, 4,400,551, Cl. 568-487.000.

Koschnitzke, Walter; and Beuth, Paul, to Ruhrchemie Aktiengesellschaft. System for measuring temperatures in pressurized reactors. 4,400,097, Cl. 374-121.000.

Kostors, Charles H.: *See—*
Miller, Arthur J.; and Kostors, Charles H., 4,400,137, Cl. 416-220.00R.

Kosuge, Shuichi; Ogura, Hiroshi; Arai, Hiroshi; and Ohta, Hisatoshi, to Toyota Jidosha Kogyo Kabushiki Kaisha; and Nippondenso Co., Ltd. Method and apparatus for indicating mileage corresponding to remaining fuel for vehicles. 4,400,779, Cl. 364-442.000.

Kotera, Noboru; Eguchi, Shusaku; Teraoka, Masanori; Takahashi, Kenji; and Miyahara, Junji, to Fuji Photo Film Co., Ltd. Method of and apparatus for obtaining a radiation image by use of a stimulable phospher. 4,400,619, Cl. 250-327.200.

Koval, Vernon E.: *See—*
Jackson, Joshua M.; and Koval, Vernon E., 4,399,877, Cl. 175-45.000.

Koval, Vitaly S.: *See—*
Vishnevsky, Vladimir S.; Koval, Vitaly S.; Lavrinenko, Vyacheslav V.; Boichenko, Oleg L.; Kartashev, Igor A.; Golovyashin, Jury V.; Serov, Nikolai F.; Shinkarenko, Leonid I.; and Jurash, Oleg G., 4,400,641, Cl. 310-323.000.

Koyama, Eiichi: *See—*
Morimoto, Masaaki; Kusakabe, Noboru; Kojima, Koichi; and Koyama, Eiichi, 4,399,853, Cl. 152-359.000.

Koyama, Shigeo: *See—*
Kozuka, Nobuhiko; Yamagata, Ryutaro; Koyama, Shigeo; Sakata, Hiromi; and Kano, Atsushi, 4,400,077, Cl. 355-3.0DR.

Kozuka, Nobuhiko; Yamagata, Ryutaro; Koyama, Shigeo; Sakata, Hiromi; and Kano, Atsushi, to Mita Industrial Company Limited. Photosensitive drum for electrostatic copying apparatus. 4,400,077, Cl. 355-3.0DR.

Kranberg, Heinz E.: *See—*
Aichinger, Horst; and Kranberg, Heinz E., 4,400,821, Cl. 378-97.000.

Krane, Jan G., to Forestlane Co., Ltd. Spring loading arrangement in a magnetic read/write head carriage assembly for a floppy disk drive. 4,400,750, Cl. 360-105.000.

Krasovsky, Jury V.: *See—*
Shevakin, Jury F.; Seidaliev, Fikrat; S.; Tjushevsky, Vladimir M.; Krasovsky, Jury V.; Glebova, Erika D.; and Chivikin, Valery K., 4,400,605, Cl. 219-61.000.

Kratzmair, Ernst, to Schaltbau Gesellschaft mbH. Delta-star connection. 4,400,629, Cl. 307-127.000.

Krause, Joachim: *See—*
Romer, Michael; Krause, Joachim; and Pohl, Ludwig, 4,400,293, Cl. 252-299.630.

Krauss, Rudolf; and Sauer, Rudolf, to Robert Bosch GmbH. Electromagnetic fuel injection valve and process to manufacture an electromagnetic fuel injection valve. 4,399,944, Cl. 239-585.000.

Kretztechnik Gesellschaft mbH: *See—*
Theumer, Christoph, 4,399,822, Cl. 128-660.000.

Krevitz, Kenneth: *See—*
Pytlewski, Louis L.; Krevitz, Kenneth; and Smith, Arthur B., 4,400,552, Cl. 568-715.000.

Kribs, David E.; and Burton, Robert, to Kribs, David E. Portable light. 4,400,763, Cl. 362-103.000.

Kroger, Ferdinand A.; Rod, Robert L.; and Panicker, M. P. Ramachandra, to Monosolar, Inc. Photo-voltaic power generating means and methods. 4,400,244, Cl. 204-2.100.

Kroh, Adolf: *See—*
Fuchs, Otto; and Kroh, Adolf, 4,400,515, Cl. 546-57.000.

Kronenberg, Marvin L.: *See—*
Blomgren, George E.; and Kronenberg, Marvin L., 4,400,453, Cl. 429-196.000.

Kropp, Philip: *See—*
Brown, Richard E.; St. Georgiev, Vassil; Kropp, Philip; and Loev, Bernard, 4,400,382, Cl. 424-250.000.

Krug, Willi, to Maho Werkzeugmaschinenbau Babel & Co. Disk magazine for use as tool holder for a universal drilling and milling machine. 4,399,604, Cl. 29-568.000.

Kruger, Horst; Berndt, Wilhelm; and Suss, Hans U., to Degussa Aktiengesellschaft. Process for bleaching cellulose with organic peracid. 4,400,237, Cl. 162-76.000.

Krull, Joseph A.; and Pavlick, Michael J., to Budd Company, The. Railway car hitch for a trailer. 4,400,121, Cl. 410-64.000.

Kubo, Seitok; Kuramochi, Koujiro; and Kyushima, Tatsuo, to Toyota Jidosha Kogyo Kabushiki Kaisha. Torque converter lock up clutch rotary damper with reinforcing lips. 4,399,895, Cl. 192-3.290.

Kudo, Takeo; Okada, Yasutaka; Moroishi, Taishi; Ikeda, Akio; Ohtani, Hiroo; and Yoshikawa, Kunihiko, to Sumitomo Metal Industries, Ltd. Alloy for making high strength deep well casing and tubing having improved resistance to stress-corrosion cracking. 4,400,209, Cl. 420-443.000.

Kudo, Takeo; Okada, Yasutaka; Moroishi, Taishi; Ikeda, Akio; Ohtani, Hiroo; and Yoshikawa, Kunihiko, to Sumitomo Metal Industries, Ltd. Alloy for making high strength deep well casing and tubing having improved resistance to stress-corrosion cracking. 4,400,210, Cl. 420-443.000.

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Kudo, Takeo; Okada, Yasutaka; Moroishi, Taishi; Ikeda, Akio; Ohtani, Hiroo; and Yoshikawa, Kunihiko, to Sumitomo Metal Industries, Ltd. Alloy for making high strength deep well casing and tubing having improved resistance to stress-corrosion cracking. 4,400,349, Cl. 420-443.000.

Kuhlthau, Hans-Peter: *See*—
Linhart, Karl; Gleinig, Harald; Raue, Roderich; and Kuhlthau, Hans-Peter, 4,400,321, Cl. 260-186.000.

Kuhnke, Hermann; and Rattner, Manfred, to Siemens Aktiengesellschaft. X-Ray diagnostic generator comprising two high voltage transformers feeding the X-ray tube. 4,400,822, Cl. 378-103.000.

Kuka Schweissanlagen & Roboter GmbH: *See*—
Zimmer, Ernst, 4,399,718, Cl. 74-409.000.

Kullik, Gunter R. J.; Durr, Werner; and Maier, Robert, to Progress-Elektrogerate Mauz & Pfeiffer GmbH & Co. Vacuum cleaner with constant air flow. 4,399,585, Cl. 15-319.000.

Kumaki, Takashi: *See*—
Saito, Takashi; Hirano, Toshio; and Kumaki, Takashi, 4,400,808, Cl. 369-262.000.

Kummer, Rudolf: *See*—
Richter, Wolfgang; Kummer, Rudolf; and Schwirten, Kurt, 4,400,549, Cl. 568-454.000.

Kundo-Kieninger & Obergfell: *See*—
Fehrenbacher, Wolfgang, 4,400,094, Cl. 368-266.000.

Kunkel, Heinrich: *See*—
Olschewski, Armin; Brandenstein, Manfred; Walter, Lothar; and Kunkel, Heinrich, 4,399,898, Cl. 198-98.000.

Kuno, Akira: *See*—
Matsumoto, Muneaki; Kuno, Akira; and Numata, Koji, 4,399,615, Cl. 33-361.000.

Kunz, Kurt, to Hans Widmaier Fabrik fur Apparate der Fernmelde-und Feinwerktechnik. Key array. 4,400,593, Cl. 200-5.00A.

Kurabe, Hyojiro; Muramatsu, Akira; and Makiguchi, Toshisada, to National Research Institute for Metals. Method for producing foundry mold for metal casting. 4,399,858, Cl. 164-16.000.

Kurafuji, Setsuo, to Fujitsu Limited. Semiconductor RAM device. 4,400,800, Cl. 365-190.000.

Kuramochi, Koujiro: *See*—
Kubo, Seitok; Kuramochi, Koujiro; and Kyushima, Tatsuo, 4,399,895, Cl. 192-3.290.

Kurashina, Kozo: *See*—
Sekimoto, Kunio; Yamamoto, Katsuhiko; Yamamitsu, Chojuro; and Kurashina, Kozo, 4,400,741, Cl. 358-312.000.

Kuroda, Katsuhiro: *See*—
Takeuchi, Yoshinobu; Kuroda, Katsuhiro; and Ozasa, Susumu, 4,400,622, Cl. 250-396.0ML.

Kuroiwa, Yosio: *See*—
Kato, Keigo; Ando, Masahisa; and Kuroiwa, Yosio, 4,399,796, Cl. 123-549.000.

Kuromitsu, Hiromu; and Adachi, Yoshiharu, to Aisin Seiki Kabushiki Kaisha. Fluid pressure operated electrical switch. 4,400,602, Cl. 200-82.00C.

Kusakabe, Noboru: *See*—
Morimoto, Masaaki; Kusakabe, Noboru; Kojima, Koichi; and Koyama, Eiichi, 4,399,853, Cl. 152-359.000.

Kusakata, Shigeru: *See*—
Matsuda, Tsutomu; and Kusakata, Shigeru, 4,400,456, Cl. 430-138.000.

Kushida, Toshimoto; and Fate, William A., to Ford Motor Company. Fast response temperature sensor. 4,400,684, Cl. 338-25.000.

Kushner, Jury K. Method and logic circuit for converting signals. 4,400,632, Cl. 307-299.00A.

Kusz, Maximillian, to Owens-Illinois, Inc. Child resistant closure and container. 4,399,921, Cl. 215-218.000.

Kutta, Helmuth W., to Atlantic Richfield Company. Process for reducing the water content of coal containing bound water. 4,400,176, Cl. 44-1.00R.

Kwant, Pieter B.; and Newsome, John R., to Shell Oil Company. Process for the preparation of hydrocarbon oil distillates. 4,400,264, Cl. 208-68.000.

Kydd, Paul H.; Chervenak, Michael C.; and DeVaux, George R., to HRI, Inc. H-Coal process and plant design. 4,400,263, Cl. 208-10.000.

Kydd, Paul H.: *See*—
Snell, George J.; and Kydd, Paul H., 4,400,181, Cl. 48-197.00R.

Kyushima, Tatsuo: *See*—
Kubo, Seitok; Kuramochi, Koujiro; and Kyushima, Tatsuo, 4,399,895, Cl. 192-3.290.

Labless, Israel: *See*—
Wyslotsky, Ihor, 4,400,230, Cl. 156-361.000.

Lacey, Stephen J.; Wardle, Frank P.; Walford, Thomas L. H.; Knight, Samuel H.; Kent, Anthony J.; and Sharman, Kenneth E., to Ransome Hoffmann Pollard Limited. Bearing arrangements. 4,400,098, Cl. 384-99.000.

Lacy, Larry D., to Rockwell International Corporation. Power distribution system with means for sensing emergency condition and reducing standby power. 4,400,626, Cl. 307-66.000.

Laczynski, Antoni. Decal assembly for inside-outside application having a reflectorized surface. 4,400,419, Cl. 428-40.000.

Lafrenz, Stanley S.: *See*—
Evans, Hugh G.; Speer, Stephen; Christy, James S.; and Lafrenz, Stanley S., 4,399,665, Cl. 62-239.000.

Lagace, Linda S.; Miller, Richard C.; and Young, David A., to Exxon Research & Engineering Co. Oxidative recovery of cobalt oxo catalysts. 4,400,299, Cl. 252-413.000.

Lagow, Richard J.; Adcock, James L.; and Maraschin, Norma J., to Massachusetts Institute of Technology. Cryogenically controlled direct fluorination process, apparatus and products resulting therefrom. 4,400,532, Cl. 560-227.000.

Lagrange, Alain; and Beauger, Alain, to LCC-CICE-Compagnie Europeenne de Composants Electroniques. Dielectric ceramic composition having a base of barium titanate, lithium oxide and cupric fluoride, a capacitor in which a composition of this type is employed, and a method of production of said composition. 4,400,759, Cl. 361-321.000.

Lagrange, Alain; and Beauger, Alain, to LCC.CICE - Compagnie Europeenne de Composants Electroniques. Dielectric ceramic composition having a base of barium titanate, lithium oxide and cadmium fluoride, a capacitor in which a composition of this type is employed, and a method of production of said composition. 4,400,760, Cl. 361-321.000.

Laing, Ingeborg: *See*—
Laing, Nikolaus; Laing, Ingeborg; and Laing, Oliver, 4,399,656, Cl. 60-659.000.

Laing, Nikolaus; Laing, Ingeborg; and Laing, Oliver. Long-period thermal storage accumulators. 4,399,656, Cl. 60-659.000.

Laing, Oliver: *See*—
Laing, Nikolaus; Laing, Ingeborg; and Laing, Oliver, 4,399,656, Cl. 60-659.000.
Schaper, Peter; and Laing, Oliver, 4,400,286, Cl. 252-70.000.

Lake, Ivan J. S.; and Whittam, Thomas V., to Imperial Chemical Industries PLC. Hydrocarbon conversion. 4,400,572, Cl. 585-481.000.

Lal, Bansi; D'Sa, Adolf; Dornauer, Horst; and de Souza, Noel J., to Hoechst Aktiengesellschaft. Processes for the manufacture of pyrimido[6,1-a]isoquinolinones. 4,400,506, Cl. 544-246.000.

Lal, Joginder; and Walters, Sandra J., to Goodyear Tire & Rubber Company, The. Composition and method of improving the unvulcanized properties of blends containing reclaimed rubber. 4,400,488, Cl. 525-211.000.

Lamar, Richard S.: *See*—
Mukamal, Harold; Lamar, Richard S.; and Ferreira, Laurence E., 4,400,485, Cl. 524-444.000.

Lamar, Roger H., to Bahnson Company, The. Controlling room-air temperature and humidity in an air-conditioning system. 4,399,864, Cl. 165-20.000.

Lamb, Richard C., to UOP Inc. Apparatus for chilling a plurality of food trays. 4,399,667, Cl. 62-382.000.

Lamed, Raphael J.: *See*—
Zeikus, Joseph G.; Ng, Thomas K.; Ben-Bassat, Arie; and Lamed, Raphael J., 4,400,470, Cl. 435-162.000.

Lamprecht, Antonio R. D. A.: *See*—
De Souza Dias, Edson; Santos, Luiz D. D.; Teixeira, Joao C.; Amorin, Osvaldo; and Lamprecht, Antonio R. D. A., 4,399,846, Cl. 141-192.000.

Lance, William A.; and Abbott, Alfred H., to Procter & Gamble Company, The. Apparatus for alternately forming and forwarding stacks of articles. 4,399,905, Cl. 198-422.000.

Landa, Benzion, to Savin Corporation. Injection roller developer for electrophotographic copier and biasing system therefor. 4,400,079, Cl. 355-10.000.

Landa, Benzion, to Savin Corporation. Microballistic facsimile scanner and recorder. 4,400,739, Cl. 358-293.000.

Landsman, Howard A.: *See*—
Jurgensen, David J.; and Landsman, Howard A., 4,400,730, Cl. 358-139.000.

Landwide Foods, Inc.: *See*—
Morley, Robert G.; and Ashton, W. Ronald, 4,400,405, Cl. 426-565.000.
Morley, Robert G.; and Ashton, W. Ronald, 4,400,406, Cl. 426-565.000.

Lane, Arlo E., to Coffman, Roy E., a part interest. Device for preventing circulation of liquid water entrained in compressed air. 4,400,187, Cl. 55-387.000.

Lane, Parley C., Jr.; Tenney, Linwood P.; and Wootton, Gerald V., to B. F. Goodrich Company, The. Anhydrous precipitation of polycycloolefins. 4,400,501, Cl. 528-496.000.

Lane, Timothy T.: *See*—
Pratt, George W., Jr.; Poss, Robert; and Lane, Timothy T., 4,399,814, Cl. 128-92.00C.
Langan, Thomas R. Roll-on picture frame. 4,399,625, Cl. 40-155.000.
Langeluddeke, Peter: *See*—
Albrecht, Konrad; and Langeluddeke, Peter, 4,400,196, Cl. 71-86.000.
Langston, Metty S. K.; and Maing, Il-Young, to General Foods Corporation. Acid soluble blue colorant for food products. 4,400,400, Cl. 426-51.000.
Lansing Bagnall Limited: *See*—
Gibbons, Ralph D., 4,399,842, Cl. 140-92.100.
Lantzsch, Reinhard: *See*—
Jautelat, Manfred; Arlt, Dieter; Lantzsch, Reinhard; Fuchs, Rainer; Riebel, Hans-Jochem; Schroder, Rolf; and Harnisch, Horst, 4,400,523, Cl. 549-320.000.
Larkin, Sam. Golf bag provided with a retractable rolling assembly. 4,400,006, Cl. 280-646.000.
Laroche-Navarron, S.A.: *See*—
Favier, Colette; Pinhas, Henri; Beranger, Serge; and Pascal, Jean-Claude, 4,400,381, Cl. 424-248.520.
Larson, John A.: *See*—
Chaiko, Walter M.; and Larson, John A., 4,400,113, Cl. 405-261.000.
Larsson, Hans F.; and Hakansson, Sven, to Axel Johnson Engineering, AB. Method and apparatus for supplying distributing composite liquids to a laminar separation apparatus. 4,400,280, Cl. 210-802.000.
LaSalle Machine Tool, Inc.: *See*—
Wiknich, Douglas D.; and Peabody, Michael J., 4,399,907, Cl. 198-718.000.
Lassanske, George G.; and Poehlman, Arthur G., to Outboard Marine Corporation. Spark advance control mechanism for dual fuel engine. 4,399,780, Cl. 123-146.50A.
Lavelle, Joseph A.: *See*—
Emmons, William D.; and Lavelle, Joseph A., 4,400,413, Cl. 427-136.000.
Lavrinenko, Vyacheslav V.: *See*—
Vishnevsky, Vladimir S.; Koval, Vitaly S.; Lavrinenko, Vyacheslav V.; Boichenko, Oleg L.; Kartashev, Igor A.; Golovyashin, Jury V.; Serov, Nikolai F.; Shinkarenko, Leonid I.; and Jurash, Oleg G., 4,400,641, Cl. 310-323.000.
Lawes, Elmer E. Fish detecting fishing rod and holder. 4,399,630, Cl. 43-17.000.
Lawrence, William J.; and Halferty, Patrick W., to James River-Dixie/-Northern, Inc. Recovery of fines in air laid papermaking. 4,400,148, Cl. 425-155.000.
Lawson, John H.: *See*—
Bartels, Leroy R.; Lawson, John H.; and King, Paul L., 4,399,890, Cl. 182-100.000.
Lazar, Joseph: *See*—
Braverman, Mel; and Lazar, Joseph, 4,399,626, Cl. 40-530.000.
LCC-CICE Compagnie Europeene de Composants Electroniques: *See*—
Chabrolle, Jacques, 4,400,752, Cl. 360-112.000.
LCC-CICE-Compagnie Europeenne de Composants Electroniques: *See*—
Lagrange, Alain; and Beauger, Alain, 4,400,759, Cl. 361-321.000.
Lagrange, Alain; and Beauger, Alain, 4,400,760, Cl. 361-321.000.
Le Armerie Italiane F.LLI Gamba S.n.c.: *See*—
Franchi, Gianfranco; and Gamba, Giovanni, 4,399,628, Cl. 42-42.00R.
Lea Ronal, Inc.: *See*—
Kessler, Richard B.; and Nobel, Fred I., 4,400,415, Cl. 427-305.000.
Leas, James M.: *See*—
Barbee, Steven G.; Leas, James M.; Lloyd, James R.; and Nagarajan, Arunachala, 4,400,715, Cl. 357-49.000.
Leason, Hayden, to Filtertek, Inc. Low-profile inline filter. 4,400,277, Cl. 210-441.000.
Leber, George W.: *See*—
Gardineer, Bayard; Mezrich, Reuben S.; and Leber, George W., 4,399,704, Cl. 73-642.000.
Lederman, Frederick E., to General Motors Corporation. Unitized seal bearing assembly. 4,400,041, Cl. 308-219.000.
Lee, Cleve L., to Nordson Corporation. Oven for skin packaging machine. 4,400,612, Cl. 219-405.000.
Lee, Corina M.: *See*—
Lee, Morris M., 4,399,840, Cl. 138-168.000.
Lee, George S.: *See*—
Samuels, Peter B.; Wood, Ernest, deceased; and Lee, George S., 4,399,810, Cl. 128-337.000.
Lee, Jack E.; and Barrett, Troy G. Hydraulic pump unit. 4,400,141, Cl. 417-360.000.
Lee, Morris M., to Lee, Morris M.; Lee, Corina M.; and Wessendorf, Walter F., Jr., part interest to each. Closure member. 4,399,840, Cl. 138-168.000.
Lee, Pok F., to Northern Telecom Limited. Digital television transmission using chrominance inversion. 4,400,718, Cl. 358-13.000.
Leggett, Geary M.: *See*—
Tracy, Gary B.; and Leggett, Geary M., 4,399,570, Cl. 4-561.000.
Legrand, Jacques, to Thomson-CSF. Magnetically controlled mercury wetted switch and electrical relay incorporating such a switch. 4,400,671, Cl. 335-56.000.
Legris, Andre, to Legris SA. Valves with lenticular or spherical closing member. 4,399,976, Cl. 251-306.000.
Legris SA: *See*—
Legris, Andre, 4,399,976, Cl. 251-306.000.
Lehner, August: *See*—
Blum, Rainer; Lehner, August; and Schenck, Hans-Uwe, 4,400,497, Cl. 528-45.000.
Leibensperger, Robert L.: *See*—
Toth, David G.; Trump, Robert S.; and Leibensperger, Robert L., 4,400,040, Cl. 308-187.000.
Lemanski, Michael F.; Spitnale, Gregory G.; and Milberger, Ernest C., to Standard Oil Company. Preparation of maleic anhydride. 4,400,522, Cl. 549-260.000.
Lemercier, Pierre: *See*—
Biancale, Pierre; Corfa, Yves-Paul; Lemercier, Pierre; Moreau, Jean-Pierre; and Vertut, Jean, 4,400,115, Cl. 405-303.000.
Lenberg, Rustan W. Front wheel indicator. 4,399,766, Cl. 116-31.000.
Lequien, Jean, to CII Honeywell Bull. Apparatus for and method of determining transverse position of a transducer head relative to read data tracks. 4,400,746, Cl. 360-77.000.
Lerner, Bernard J. Removal of nitrogen oxides from gas. 4,400,362, Cl. 423-235.000.
Lessway, Richard J. True centering steady rest. 4,399,639, Cl. 51-238.00S.
Leto, Anthony: *See*—
Cole, Rossa W.; and Leto, Anthony, 4,399,652, Cl. 60-39.465.
Lettington, Alan H.: *See*—
Green, Geoffrey W.; and Lettington, Alan H., 4,400,410, Cl. 427-39.000.
Leunig, Carl V.; and Smith, Stewart W., to Albany International Corporation. Constant tension device for filter bag. 4,400,186, Cl. 55-379.000.
Lever Brothers Company: *See*—
Beavan, Stuart W., 4,400,173, Cl. 8-107.000.
Levine, Zelman: *See*—
Mollen, Alfred; and Levine, Zelman, 4,399,912, Cl. 206-387.000.
Lewis, Jack R.; and Walter, Robert J., to Rockwell International Corporation. Fiber reinforced electroformed superplastic nickel-cobalt matrices. 4,400,442, Cl. 428-544.000.
Lezan, Georges R. E., to General Electric Company. Overvoltage protection circuit. 4,400,755, Cl. 361-91.000.
Licciardello, Michael; Boden, Richard M.; Watkins, Hugh; and Hanna, Marie R., to International Flavors & Fragrances Inc. Process for augmenting or enchancing the aroma of detergent compositions using oxyalkyl esters. 4,400,290, Cl. 252-174.110.
Lientz, la Clede. Refuse burning process. 4,399,756, Cl. 110-346.000.
Lientz, la Clede. Refuse burning apparatus. 4,400,154, Cl. 432-115.000.
Liess, Hans D.: *See*—
Wirtzfeld, Alexander; Heinze, Roland; Bock, Thomas; and Liess, Hans D., 4,399,820, Cl. 128-419.0PG.
Lietzke, Heinz; and Mayr, Heribert K., to Deutsche Babcock Aktiengesellschaft; and Schiess-Defries Hebezeug-und Transporteinrichtungen GmbH. Arrangement for raising and lowering a floating offshore platform. 4,400,111, Cl. 405-196.000.
Light, Rickey W.: *See*—
Stobbs, William; Hines, Charles; and Light, Rickey W., 4,400,588, Cl. 179-81.00R.
Liljekvist, Bernt S.; and Persson, Anders E., to Santrade Ltd. Boring head. 4,399,879, Cl. 175-372.000.
Lin, Robert A.: *See*—
Cooke, Theodore M.; Lin, Robert A.; Whitfield, Richard G.; and Hock, Allan G., 4,400,215, Cl. 106-22.000.
Linde Aktiengesellschaft: *See*—
Strigl, Reinhard, 4,399,659, Cl. 62-52.000.
Lindsey, Hiram E., Jr., to MWL Tool and Supply Company. Retrievable insert landing assembly. 4,399,873, Cl. 166-380.000.
Lindsey, John S.: *See*—
Henslee, Walter W.; Lindsey, John S.; Morrow, Stanley J.; Periard, John N.; and Whitworth, Charles R., 4,400,431, Cl. 428-402.000.
Lindstrom, Merlin R.; Louthan, Rector P.; and Macdonell, Gary D., to Phillips Petroleum Company. Sulfur based metal cleaners. 4,400,312, Cl. 252-545.000.
Lingertat, Helmut: *See*—
Moschetti, Anthony P.; Smith, J. Thomas; Quackenbush, Carr L. W.; Lingertat, Helmut; and Nehring, Vincent W., 4,400,427, Cl. 428-332.000.
Linhart, Karl; Gleinig, Harald; Raue, Roderich; and Kuhlthau, Hans-Peter, to Bayer Aktiengesellschaft. Process for the preparation of solutions of cationic polyazo dyestuffs. 4,400,321, Cl. 260-186.000.
Linhoff & Thesenfitz Maschinenbau GmbH: *See*—
Thesenfitz, Klaus, 4,400,155, Cl. 432-151.000.
Linnea S.A.: *See*—
Benardelli, Giovanni, 4,400,249, Cl. 204-158.00R.
Linsinger, Ernst: *See*—
Malinowski, Hans; Pielsticker, Klaus-Peter; and Linsinger, Ernst, 4,399,729, Cl. 83-455.000.
List, Hans: *See*—
List, Helmut; Claassen, Peter; and Zeiringer, Rudolf, 4,399,706, Cl. 73-708.000.
List, Helmut; Claassen, Peter; and Zeiringer, Rudolf, to List, Hans. Pressure indicator for measurement of hot pressure mediums. 4,399,706, Cl. 73-708.000.
Littauer, Ernest L.: *See*—
Gerenser, Robert J.; and Littauer, Ernest L., 4,400,447, Cl. 429-27.000.
Litton Resources Systems, Inc.: *See*—
Vivian, John; Cooper, Patrick R.; Higgins, Ronald B.; Harlan, John A.; Perry, Paul M.; Vallhonrat, Juan B.; and Golden, Donald P., Jr., 4,400,778, Cl. 364-200.000.

Lloyd, James R.: *See—*
Barbee, Steven G.; Leas, James M.; Lloyd, James R.; and Nagarajan, Arunachala, 4,400,715, Cl. 357-49.000.

Locke, Philip F., Jr.; and Maxwell, Albert H., Jr., to Westinghouse Electric Corp. Event-logging system. 4,400,783, Cl. 364-483.000.

Lockheed Corporation: *See—*
Sandorff, Paul E., 4,399,967, Cl. 244-134.00R.

Loev, Bernard: *See—*
Brown, Richard E.; St. Georgiev, Vassil; Kropp, Philip; and Loev, Bernard, 4,400,382, Cl. 424-250.000.

Loffelman, Frank F.; and Brady, Thomas E., to American Cyanamid Company. Triazinyl-piperidines as light stabilizers for polymers. 4,400,505, Cl. 544-198.000.

Logan, Brian M., to Goodyear Tire & Rubber Company, The. Bladderless, clampless curing. 4,400,342, Cl. 264-501.000.

Logsdon, Duane D. Drain grate with adjustable weirs. 4,400,272, Cl. 210-166.000.

Lohrey, Edwin J., to General Electric Company. Shaped inlead wires in electric lamps. 4,400,646, Cl. 313-333.000.

Loire Cosmetics Co., Ltd.: *See—*
Ootsu, Yoshiro; and Arima, Yaeno, 4,400,295, Cl. 252-356.000.

Lokshin, Viktor E.: *See—*
Pastushenko, Jury I.; Spynu, Gleb A.; Nazarenko, Oleg K.; Lokshin, Viktor E.; and Shapoval, Vladimir I., 4,400,609, Cl. 219-121.0EV.

Long, David J., to Everett/Charles, Inc. Video process control apparatus. 4,400,728, Cl. 358-107.000.

Long, John G., to Durst (U.K.) Limited. Photographic exposure masks. 4,400,084, Cl. 355-74.000.

Longoni, Angelo: *See—*
Gozzo, Franco; Boschi, Pier M.; and Longoni, Angelo, 4,400,517, Cl. 548-118.000.

Losh, Russell L., to Talbert Manufacturing, Inc. Tractor-trailer connector means with retractable coupling pins. 4,400,005, Cl. 280-423.00B.

Louthan, Rector P.: *See—*
Lindstrom, Merlin R.; Louthan, Rector P.; and Macdonell, Gary D., 4,400,312, Cl. 252-545.000.

Love, Samuel D. Fireplace draft control. 4,399,806, Cl. 126-143.000.

Low Energy Homes, Inc.: *See—*
Munson, Richard W., 4,400,766, Cl. 362-376.000.

Lowery, Jack R., Sr.: *See—*
Everall, Palmer B., Jr.; and Lowery, Jack R., Sr., 4,399,991, Cl. 271-175.000.

Lubbers, Marius H., to Everts & Van der Weyden Exploitatiemaatschappij Ewem B.V. Rail clamp. 4,399,941, Cl. 238-349.000.

Lubrizol Corporation, The: *See—*
Hoke, Donald I., 4,400,178, Cl. 44-72.000.

Lucas Industries Limited: *See—*
Clarke, Robert S., 4,400,023, Cl. 285-302.000.

Ludvig Svensson (Holland) B.V.: *See—*
Henningsson, Goran, 4,399,671, Cl. 66-196.000.

Lunceford, Randy L. Captive air system for water well. 4,400,271, Cl. 210-136.000.

Lundstrom, Kurt I.: *See—*
Kindlund, Alf R.; and Lundstrom, Kurt I., 4,399,686, Cl. 73-23.000.

Lustig, Leopold P.; and Rosen, Alfred H., to Lustig, Leopold Paul. Atraumatic endodontic reconstruction system and process. 4,400,160, Cl. 433-224.000.

Lustig, Leopold Paul: *See—*
Lustig, Leopold P.; and Rosen, Alfred H., 4,400,160, Cl. 433-224.000.

Lynch, Henry W.: *See—*
Finney, Roy P.; Lynch, Henry W.; and Trick, Robert E., 4,399,811, Cl. 128-79.000.

Lynn, William J.: *See—*
Fukukura, Kazutoyo; and Lynn, William J., 4,400,596, Cl. 200-5.00A.

M.A.N.-Roland Druckmaschinen Aktiengesellschaft: *See—*
Simeth, Claus, 4,399,767, Cl. 118-46.000.

M.M.T. Inc.: *See—*
Takeda, Hirofumi; and Suzuki, Hirobumi, 4,400,418, Cl. 428-36.000.

Macchia, John L., to Okonite Company, The. Wire and cable process control apparatus. 4,399,953, Cl. 242-47.080.

MacDonald, Ronald: *See—*
Dhanani, Shafiq; MacDonald, Ronald; Clunie, James S.; and Brooks, Maxim C., 4,400,288, Cl. 252-135.000.

Macdonell, Gary D.: *See—*
Lindstrom, Merlin R.; Louthan, Rector P.; and Macdonell, Gary D., 4,400,312, Cl. 252-545.000.

MacLeod, Robert B., Jr.: *See—*
Gelardi, Anthony L.; Gelardi, Paul J.; and MacLeod, Robert B., Jr., 4,399,913, Cl. 206-387.000.

Macovski, Albert. Transition system for color television receivers. 4,400,721, Cl. 358-37.000.

Madaus, Rolf; Stumpf, Werner; Gorler, Klaus; and Carcasona-Beltran, Alfonso, to Dr. Madaus & Co. Acidic alkali citrate and compositions for adjusting the pH of urine. 4,400,535, Cl. 562-584.000.

Maddalena, Richard E. Dry material dispenser. 4,399,931, Cl. 222-282.000.

Maeda Industries, Ltd.: *See—*
Hosokawa, Mikio, 4,400,038, Cl. 301-111.000.

Maeda, Nobutaka: *See—*
Omori, Shunji; Hayashi, Kanji; Hiasa, Yukio; Maeda, Nobutaka; Hashimoto, Shoichi; and Yoshiya, Hiroki, 4,399,727, Cl. 83-345.000.

Maffrand, Jean-Pierre: *See—*
Amselem, Armand; Eloy, Fernand; and Maffrand, Jean-Pierre, 4,400,384, Cl. 424-256.000.

Magnetic Peripherals Inc.: *See—*
Elliott, Mark L., 4,400,654, Cl. 318-312.000.

Magnusson, Leif L.: *See—*
Jorgensen, Karl G.; Magnusson, Leif L.; and Olsson, Curt S., 4,399,745, Cl. 100-2.000.

Maho Werkzeugmaschinenbau Babel & Co.: *See—*
Krug, Willi, 4,399,604, Cl. 29-568.000.

Maidique, Modesto A.: *See—*
Brokaw, Adrian P.; and Maidique, Modesto A., 4,400,689, Cl. 340-347.0AD.
Brokaw, Adrian P.; and Maidique, Modesto A., 4,400,690, Cl. 340-347.0AD.

Maier, Lawrence R.: *See—*
Bupp, James R.; and Maier, Lawrence R., 4,400,618, Cl. 250-302.000.

Maier, Robert: *See—*
Kullik, Gunter R. J.; Durr, Werner; and Maier, Robert, 4,399,585, Cl. 15-319.000.

Maing, Il-Young: *See—*
Langston, Metty S. K.; and Maing, Il-Young, 4,400,400, Cl. 426-51.000.

Majewicz, Thomas G., to Hercules Incorporated. Readily dispersible anionic, water-soluble cellulose derivatives and a method for their preparation. 4,400,502, Cl. 536-87.000.

Makiguchi, Toshisada: *See—*
Kurabe, Hyojiro; Muramatsu, Akira; and Makiguchi, Toshisada, 4,399,858, Cl. 164-16.000.

Malesky, Edwin V.; and Malesky, Lawrence C. Flexible cleaning shaft with brush adapter. 4,399,627, Cl. 42-1.0BC.

Malesky, Lawrence C.: *See—*
Malesky, Edwin V.; and Malesky, Lawrence C., 4,399,627, Cl. 42-1.0BC.

Malinowski, Hans; Pielsticker, Klaus-Peter; and Linsinger, Ernst, to SMS Schloemann-Siemag Aktiengesellschaft. Apparatus for severing the end of a metal strip wound in a coil. 4,399,729, Cl. 83-455.000.

Mallinson, Roger H.: *See—*
Ramshaw, Colin; and Mallinson, Roger H., 4,400,275, Cl. 210-321.100.

Maluke, Edward M.: *See—*
Bowyer, John M.; Flower, George W.; and Maluke, Edward M., 4,399,752, Cl. 102-217.000.

Mamadzhanov, Ulmas D.; Bakhir, Vitold M.; Klimenko, Vladimir I.; Alekhin, Stanislav A.; and Zadorozhny, Jury G. Method and apparatus for separating solid phase from drilling mud. 4,400,266, Cl. 209-130.000.

Mandel, Alan F.; Eichler, Kenneth M.; and Bauman, Douglas A., to Westinghouse Electric Corp. Elevator system with speech synthesizer for audible information. 4,400,786, Cl. 364-513.000.

Mandel, Alan F.; and Eichler, Kenneth M. Elevator system with speech synthesizer for repetition of messages. 4,400,787, Cl. 364-513.000.

Manderscheid, Phillip H.: *See—*
Baugh, John L.; Montgomery, James W.; and Manderscheid, Phillip H., 4,399,870, Cl. 166-324.000.

Mannesmann Aktiengesellschaft: *See—*
Hendrischk, Wolfgang, 4,400,101, Cl. 400-124.000.

Manson, Ernest T.; and Taylor, Byron K., to RCA Corporation. Pickup arm suspension for video disc cartridge. 4,400,806, Cl. 369-170.000.

Manu-Tronics, Inc.: *See—*
Synek, Jan; and Tentler, Michael, 4,400,589, Cl. 179-81.00R.

Maraschin, Norma J.: *See—*
Lagow, Richard J.; Adcock, James L.; and Maraschin, Norma J., 4,400,532, Cl. 560-227.000.

Marcil, Jacques N., to Ford Motor Company. Diecasting assembly. 4,399,859, Cl. 164-342.000.

Marconi Instruments Limited: *See—*
Owen, David P., 4,400,630, Cl. 307-219.100.

Maringer, Melvin F.: *See—*
Barlow, Anthony; and Maringer, Melvin F., 4,400,429, Cl. 428-379.000.

Maringer, Thomas E. Article of decorative metal manufacture. 4,399,611, Cl. 30-350.000.

Marion, Charles P.; Brent, Albert; Richter, George N.; Crouch, William B.; Child, Edward T.; and Reynolds, Blake, to Texaco Inc. Partial oxidation high turndown apparatus. 4,400,179, Cl. 48-86.00R.

Marion, Charles P.; Crouch, William B.; Brent, Albert; Richter, George N.; Child, Edward T.; and Reynolds, Blake, to Texaco, Inc. Partial oxidation process. 4,400,180, Cl. 48-197.00R.

Marko Materials, Inc.: *See—*
Ray, Ranjan; and Panchanathan, Viswanathan, 4,400,212, Cl. 75-251.000.

Marleau, Gilles. Compact combination tool set. 4,399,723, Cl. 81-437.000.

Marmon Group, Inc., The: *See—*
Blake, Nolen C., 4,400,131, Cl. 414-491.000.

Marotta Scientific Controls, Inc.: *See—*
de Versterre, William I.; and Worden, Donald A., 4,399,836, Cl. 137-487.500.

Marquis, Edward T.: *See—*
Darden, Jerome W.; Marquis, Edward T.; and Watts, Lewis W., Jr., 4,400,565, Cl. 585-10.000.

Martin, Andrew M., to Martin, Andrew McG. Tape dispenser/applicator. 4,400,231, Cl. 156-527.000.

Martin, Andrew McG.: *See*—
Martin, Andrew M., 4,400,231, Cl. 156-527.000.
Martin, Jean-Claude: *See*—
Piquet, Christian; and Martin, Jean-Claude, 4,400,092, Cl. 368-82.000.
Martin, Jean-Marie M. Machine for drying and butt-jointing wood veneer by continuous contact engagement. 4,399,619, Cl. 34-148.000.
Martin, Joel L., to Phillips Petroleum Company. Catalyst for olefin polymerization. 4,400,303, Cl. 252-429.00B.
Martini, Thomas; and Rosch, Gunter, to Hoechst Aktiengesellschaft. Mixtures of optical brighteners. 4,400,294, Cl. 252-301.240.
Martinola, Friedrich, to Bayer Aktiengesellschaft. Counter-current adsorption filters for the treatment of liquids and a method of operating the filter. 4,400,278, Cl. 210-678.000.
Maruta, Fumio: *See*—
Izumi, Toshiaki; Maruta, Fumio; Kobuke, Takayoshi; and Noguchi, Kiyoshi, 4,400,444, Cl. 428-694.000.
Maruya, Kazuo: *See*—
Ishiguro, Jiro; and Maruya, Kazuo, 4,400,433, Cl. 428-408.000.
Maruzzo, Walter F.; and DeBoersap, Herman, to Design Dynamics Limited. Seat covers. 4,400,030, Cl. 297-219.000.
Marx, Jorg: *See*—
Walkow, Fred; Czerney, Peter; Hartmann, Horst; and Marx, Jorg, 4,400,458, Cl. 430-157.000.
Masaki, Sokukawa: *See*—
Takeuchi, Tatsuro; Masaki, Sokukawa; and Ryuzo, Kimoto, 4,400,305, Cl. 252-430.000.
Mascioli, Rocco L.: *See*—
Bechara, Ibrahim S.; and Mascioli, Rocco L., 4,400,476, Cl. 521-107.000.
Maskasky, Joe E., to Eastman Kodak Company. Silver chloride emulsions of modified crystal habit and processes for their preparation. 4,400,463, Cl. 430-434.000.
Massachusetts Institute of Technology: *See*—
Lagow, Richard J.; Adcock, James L.; and Maraschin, Norma J., 4,400,532, Cl. 560-227.000.
Pratt, George W., Jr.; Poss, Robert; and Lane, Timothy T., 4,399,814, Cl. 128-92.00C.
Massy, Derek J. R.: *See*—
Demmer, Christopher G.; Francombe, Roger; Garnish, Edward W.; and Massy, Derek J. R., 4,400,229, Cl. 156-307.500.
Masuda, Naosuke; Suzuki, Yoshio; and Ohe, Takeshi, to Jidosha Kiki Co., Ltd. Oil pump. 4,400,139, Cl. 417-304.000.
Masuda, Tsuneharu: *See*—
Noyori, Tatsuhiko; Ueda, Masakazu; Aoki, Masanobu; Kajima, Takashi; and Masuda, Tsuneharu, 4,399,676, Cl. 72-40.000.
Masyc AG: *See*—
Gunti, Rolf, 4,399,908, Cl. 198-789.000.
Matcor, Inc.: *See*—
Schutt, William R., 4,400,259, Cl. 204-196.000.
Mathew, Chempolil T.; and Ulmer, Harry E., to Allied Corporation. Producing oximinosilanes, oximinogermanes and oximinostannanes. 4,400,527, Cl. 556-422.000.
Matsuda, Mutsuhide: *See*—
Tamura, Shuichi; Suzuki, Toyotosi; Tamamura, Hideo; and Matsuda, Mutsuhide, 4,400,071, Cl. 354-25.000.
Matsuda, Tsutomu; and Kusakata, Shigeru, to Ricoh Co., Ltd. Thermodevelopable type diazo copying material. 4,400,456, Cl. 430-138.000.
Matsumoto, Muneaki; Kuno, Akira; and Numata, Koji, to Nippon Soken, Inc. Direction indicator. 4,399,615, Cl. 33-361.000.
Matsumura, Naomi: *See*—
Kaneda, Saburo; Matsumura, Naomi; Ikegami, Fujio; Shimizu, Kazuyuki; and Ikuta, Yukichi, 4,400,769, Cl. 364-200.000.
Matsuno, Yoshio, to Nissan Motor Co., Ltd. Vehicle body construction. 4,400,011, Cl. 280-748.000.
Matsuo, Fumio: *See*—
Fukui, Kiyoshi; Kakeya, Noboru; Jibiki, Hiroshi; and Matsuo, Fumio, 4,400,508, Cl. 544-313.000.
Matsuoka, Michio: *See*—
Eda, Kazuo; Inada, Masanori; and Matsuoka, Michio, 4,400,683, Cl. 338-21.000.
Matsushita Electric Industrial Co., Ltd.: *See*—
Eda, Kazuo; Inada, Masanori; and Matsuoka, Michio, 4,400,683, Cl. 338-21.000.
Miyatake, Yoshito; Nagaoka, Yoshitomi; and Nakajima, Yasuo, 4,400,722, Cl. 358-60.000.
Ogawa, Yasuhiro; Shida, Sankichi; Honjo, Katsuhiko; and Todoroki, Tsunehiko, 4,400,214, Cl. 106-1.130.
Sekimoto, Kunio; Yamamoto, Katsuhiko; Yamamitsu, Chojuro; and Kurashina, Kozo, 4,400,741, Cl. 358-312.000.
Yamamitsu, Chojuro; Arimura, Ichiro; and Ohtsu, Masamitsu, 4,400,742, Cl. 358-318.000.
Matzuk, Terrance, to Dymax Corporation. Ultrasonic transducer and integral drive circuit therefor. 4,399,703, Cl. 73-621.000.
Maulding, Gary L.: *See*—
Cave, David L.; Maulding, Gary L.; and Weber, Howard F., 4,400,756, Cl. 361-152.000.
Maurel, Pierre; and Nicolas, Francois, to Aluminium Pechiney. Process for the hot oxidized attack on a uraniferous ore by a concentrated alkaline liquor with simultaneous uranium precipitation. 4,400,359, Cl. 423-15.000.
Maury, Jean-Pierre, to Nodet - Gougis. Seeding machine with a pneumatic seed ejecting means, especially for vegetable culture. 4,399,757, Cl. 111-34.000.
Maxwell, Albert H., Jr.: *See*—
Locke, Philip F., Jr.; and Maxwell, Albert H., Jr., 4,400,783, Cl. 364-483.000.
May, Charles W.: *See*—
Poore, Bernard B.; and May, Charles W., 4,399,793, Cl. 123-502.000.
May, Geoffrey J., to Chloride Group Limited. Method and apparatus for making recombinant storage batteries having coated intercell connectors. 4,399,607, Cl. 29-623.500.
May, Paul H., to Bell Telephone Laboratories, Incorporated. Shunt fault tester for multiconductor cable. 4,400,663, Cl. 324-52.000.
Mayer, Arthur, to Sperry Corporation. Gravity gradiometer compass. 4,399,694, Cl. 73-178.00R.
Mayer, Edward F., to Ricoh Company, Ltd. Electrophotographic copying apparatus and subsystems therefor. 4,400,078, Cl. 355-3.0DD.
Mayer, Siegfried: *See*—
Dworak, Wilhelm; Muller, Karl-Heinz; Mayer, Siegfried; Talmon, Wolfgang; and Grabow, Kurt, 4,400,146, Cl. 418-131.000.
Mayr, Heribert K.: *See*—
Lietzke, Heinz; and Mayr, Heribert K., 4,400,111, Cl. 405-196.000.
Mazgy, James D., to RCA Corporation. Wide temperature range switching circuit. 4,400,635, Cl. 307-445.000.
McCarroll, Raymond A., to Herder, N.V. Dual wheel caster. 4,399,586, Cl. 16-31.00R.
McClelland, Larry R.: *See*—
Southworth, Glen R.; McClelland, Larry R.; and Johnson, Bruce F., 4,400,717, Cl. 358-13.000.
McConaughy, Robert C.; and Wright, Joe W., to Chevron Research Company. Guidelineless system for riser entry/reentry that permits quick release of a riser column from a subsea installation. 4,399,872, Cl. 166-341.000.
McCray, Charles M.; and Grubbs, William A., to International Business Machines Corp. Shuttle printer and drive mechanism. 4,400,104, Cl. 400-320.000.
McCulloch, Roger L. Portable support platform. 4,399,972, Cl. 248-346.000.
McDonald, Winford G. Enlarged coin box for product dispenser. 4,399,903, Cl. 194-1.00F.
McDonell, Thomas L.: *See*—
Kienlen, Loren C.; and McDonell, Thomas L., 4,399,805, Cl. 126-121.000.
McGilvray, Bruce L.: *See*—
Chan, Shiu K.; Gerardi, John A.; and McGilvray, Bruce L., 4,400,770, Cl. 364-200.000.
McKay, Nicholas D., to Helmac Products Corporation. Lint remover. 4,399,579, Cl. 15-104.00A.
McKee, Gerald D.: *See*—
Draper, David L.; and McKee, Gerald D., 4,399,600, Cl. 29-401.100.
McMahon, Joseph F.; and Steiner, Peter, to Foster Wheeler Energy Corporation. Process for activating a steam reforming catalyst and the catalyst produced by the process. 4,400,309, Cl. 252-472.000.
McNaughton, Allen D.; Albert, Stephen B.; and Furbershaw, Gerard A., to Syntex (U.S.A.) Inc. Implanting device and implant magazine. 4,400,170, Cl. 604-62.000.
McRoberts, William J. Apparatus for draining viscous fluids. 4,399,847, Cl. 141-364.000.
McVay, Donald R.; and Setzer, Herbert J., to United Technologies Corporation. Combustion catalyst bed. 4,400,356, Cl. 422-171.000.
Medical Engineering Corporation: *See*—
Finney, Roy P.; Lynch, Henry W.; and Trick, Robert E., 4,399,811, Cl. 128-79.000.
Medley, Douglas G. Pet door. 4,399,771, Cl. 119-19.000.
Meister, John J.: *See*—
Butler, George B.; Hogen-Esch, Thieo E.; Meister, John J.; and Pledger, Huey, Jr., 4,400,496, Cl. 527-312.000.
Melin, Arthur K. Two handed tennis racket. 4,399,993, Cl. 273-73.00R.
Mendiratta, Ashok K., to General Electric Company. Ion exchange catalyzed bisphenol synethesis. 4,400,555, Cl. 568-728.000.
Mennemann, Karl; Gliemeroth, Georg; and Geiler, Volkmar, to Schott Glaswerke. Acidproof, hydrolysis-resistant optical and ophathalmic glass of low density. 4,400,473, Cl. 501-77.000.
Menz, D. Darrell, to United States of America, Navy. Passive shock mitigation system with sea water metering shock absorber. 4,399,764, Cl. 114-219.000.
Merck & Co., Inc.: *See*—
Christensen, Burton G.; Ratcliffe, Ronald W.; and Salzmann, Thomas N., 4,400,323, Cl. 260-239.00A.
Firestone, Raymond A., 4,400,395, Cl. 424-319.000.
Merck Patent Gesellschaft mit beschrankter Haftung: *See*—
Romer, Michael; Krause, Joachim; and Pohl, Ludwig, 4,400,293, Cl. 252-299.630.
Vormbrock, Rolf; and Helger, Roland, 4,400,464, Cl. 435-21.000.
Merrell Dow Pharmaceuticals Inc.: *See*—
Ritter, Harry W.; and Edwards, Michael L., 4,400,380, Cl. 424-248.500.
Meserol, Peter M.; and Acker, Jesse L., to Akro-Medic Engineering, Inc. Electro-optical system for use in evaluating immunological reactions. 4,400,353, Cl. 422-73.000.
Messerschmitt-Boelkow-Blohm Gesellschaft mit beschraenkter Haftung: *See*—
Bschorr, Oskar, 4,399,851, Cl. 152-156.000.
Metals Technology & Instrumentation, Inc.: *See*—
Ginatta, Marco V., 4,400,247, Cl. 204-59.00M.

Metme Communications: *See*—
Bloy, Graham P., 4,400,583, Cl. 179-1.00D.
Metz, Donald L. Truck locking device. 4,400,127, Cl. 414-401.000.
Metz, Paul, to Arbed S.A. Apparatus for the production of liquid iron, especially for directly producing liquid iron from ore. 4,399,983, Cl. 266-176.000.
Mezrich, Reuben S.: *See*—
Gardineer, Bayard; Mezrich, Reuben S.; and Leber, George W., 4,399,704, Cl. 73-642.000.
Miba Gleitlager Aktiengesellschaft: *See*—
Ehrentraut, Otto, 4,400,099, Cl. 384-283.000.
Micco, Felice A.: *See*—
Traino, James C.; Micco, Felice A.; and Keene, Douglas L., 4,400,740, Cl. 358-293.000.
Michel, Karl H.; and Hoehn, Marvin M., to Eli Lilly and Company. A-32256 Phenazine antibiotic. 4,400,510, Cl. 544-347.000.
Michelson, Robin P., to University of California, The Regents of the. Apparatus for multichannel cochlear implant hearing aid system. 4,400,590, Cl. 179-107.0FD.
Micheron, Francois, to Thomson-CSF. Bimorph transducer made from polymer material. 4,400,634, Cl. 307-400.000.
Mick, John C., to United States of America, Air Force. Semiautomatic swaybrace. 4,399,733, Cl. 89-1.50B.
Micro Mega Societe Anonyme: *See*—
Garcia, Philippe, 4,400,158, Cl. 433-127.000.
Midland-Ross Corporation: *See*—
Bouchon, Jean-Claude M., 4,399,984, Cl. 266-252.000.
Mifune, Takao: *See*—
Kobayashi, Junichi; Mifune, Takao; and Tanabe, Shoji, 4,400,639, Cl. 310-215.000.
Mihalyfi, Krisztina: *See*—
Szantay, Csaba; Szabo, Lajos; Kalaus, Gyorgy; Dancsi, Lajos; Keve, Tibor; Drexler, Ferenc; and Mihalyfi, Krisztina, 4,400,514, Cl. 546-51.000.
Miki, Yusaku: *See*—
Nozaki, Masaharu; Nakamura, Hiroshi; and Miki, Yusaku, 4,400,775, Cl. 364-200.000.
Milan, Ernest A., to Goodyear Tire & Rubber Company, The. Method and apparatus for cutting plastic materials. 4,399,725, Cl. 83-17.000.
Milberger, Ernest C.: *See*—
Lemanski, Michael F.; Spitnale, Gregory G.; and Milberger, Ernest C., 4,400,522, Cl. 549-260.000.
Millar, Malcolm H.: *See*—
Haughey, Douglas P.; and Millar, Malcolm H., 4,399,633, Cl. 47-57.600.
Miller, Arthur J.; and Kostors, Charles H., to Elliott Turbomachinery Co., Inc. Rotor assembly and methods for securing a rotor blade therewithin and removing a rotor blade therefrom. 4,400,137, Cl. 416-220.00R.
Miller, Charles G., deceased: *See*—
Youngberg, Charles L.; Miller, Charles G., deceased; Stephens, James B.; and Finnerty, Anthony A., 4,400,191, Cl. 65-21.400.
Miller, Richard C.: *See*—
Lagace, Linda S.; Miller, Richard C.; and Young, David A., 4,400,299, Cl. 252-413.000.
Miller, Robert J.: *See*—
Beisty, James M.; Miller, Robert J.; and Romeo, Albert J., 4,400,083, Cl. 355-16.000.
Milligan, Timothy H., to Willamette Industries, Inc. Pallet unloading apparatus. 4,400,128, Cl. 414-417.000.
Milliken Research Corporation: *See*—
DeMott, Roy P., 4,400,414, Cl. 427-210.000.
Keller, Margaret S.; and Brendle, Ralph N., 4,400,320, Cl. 260-158.000.
Milling Specialties, Inc.: *See*—
Smith, Theo J., 4,400,117, Cl. 407-49.000.
Mills, J. T., to Sentinel Manufacturing Company, Incorporated. Engine protective device responsive to low oil pressure. 4,399,785, Cl. 123-198.0DB.
Millsap, Cecil E., to Thomas Conveyor Company, Inc. Temperature expansive screw conveyor. 4,399,906, Cl. 198-662.000.
Milo, August. Tank bottom shield. 4,399,923, Cl. 220-85.00R.
Milzner, Karlheinz, to Sandoz Ltd. Novel pyrimidinyl ethers, their use as herbicides, herbicidal compositions comprising said pyrimidinyl ethers and processes for the preparation thereof. 4,400,201, Cl. 71-92.000.
Minato, Ichiro; Shibata, Koichi; and Fujinami, Kimiya, to Takeda Chemical Industries, Ltd. Polyglycidyl compounds. 4,400,525, Cl. 549-552.000.
Miner, William R.: *See*—
Deline, Richard R.; and Miner, William R., 4,400,132, Cl. 414-569.000.
Ministry of International Trade & Industry: *See*—
Osumi, Yasuaki; Suzuki, Hiroshi; Kato, Akihiko; Oguro, Keisuke; and Nakane, Masanori, 4,400,348, Cl. 420-443.000.
Minnaar, Daniel; and Straughan, Clive, to Coalequip (Proprietary) Limited. Expansion bolt. 4,400,122, Cl. 411-67.000.
Minnis, Ralph L.; Ragas, Frank J.; and Beauchamp, Gerson E., to DeSoto, Inc. Electrographic coating containing aqueous emulsion copolymerized acrylamide copolymers. 4,400,441, Cl. 428-514.000.
Minolta Camera Kabushiki Kaisha: *See*—
Izumi, Shuji; Sahara, Masayoshi; and Nakai, Masaaki, 4,400,691, Cl. 340-347.0AD.
Kiba, Akira, 4,400,082, Cl. 355-15.000.
Misaka, Eiichi: *See*—
Terada, Atsusuke; and Misaka, Eiichi, 4,400,534, Cl. 562-468.000.
Miskell, Ford F. Indirectly heated rotary calciner having weighted cylindrical extensions. 4,400,153, Cl. 432-103.000.
Miskowicz, John S.; and Fischbacher, David R., to Gateway Industries, Inc. Dual reel retractor. 4,399,955, Cl. 242-107.40A.
Misumi, Teruyuki: *See*—
Yokoyama, Shigeo; Misumi, Teruyuki; Fujimoto, Einosuke; and Kobayashi, Yutaka, 4,400,199, Cl. 71-88.000.
Mita, Akira, to Nippon Seiko Kabushiki Kaisha. Locking device for the webbing for seat belt. 4,399,956, Cl. 242-107.200.
Mita Industrial Company Limited: *See*—
Kozuka, Nobuhiko; Yamagata, Ryutaro; Koyama, Shigeo; Sakata, Hiromi; and Kano, Atsushi, 4,400,077, Cl. 355-3.0DR.
Mitchell, Robert R., to United States of America, Army. Tone burst reticle beamrider missile guidance. 4,399,961, Cl. 244-3.130.
Mitchell, Thomas O.; and Whitehurst, Darrell D., to Mobil Oil Corporation. Catalytic conversion. 4,400,561, Cl. 568-902.000.
Mitsubishi Denki Kabushiki Kaisha: *See*—
Ishibashi, Kiyoshi, 4,400,682, Cl. 338-4.000.
Itoh, Testuro; Oizumi, Toshiro; and Yamada, Shigeo, 4,400,606, Cl. 219-69.00M.
Kimura, Hiroshi; and Kai, Junjiro, 4,400,287, Cl. 252-70.000.
Watanabe, Eiki, 4,399,892, Cl. 187-29.00R.
Mitsubishi Jukogyo Kabushiki Kaisha: *See*—
Omori, Shunji; Hayashi, Kanji; Hiasa, Yukio; Maeda, Nobutaka; Hashimoto, Shoichi; and Yoshiya, Hiroki, 4,399,727, Cl. 83-345.000.
Mitsubishi Kinzoku Kabushiki Kaisha: *See*—
Komori, Shinichi; Shimanuki, Yasushi; and Suzuki, Isamu, 4,400,351, Cl. 420-489.000.
Mitsui, Hisayasu, to Tokyo Shibaura Denki Kabushiki Kaisha. Electrically insulated coil. 4,400,676, Cl. 336-205.000.
Mitsui Toatsu Chemicals, Inc.: *See*—
Asano, Makoto; Kawashima, Saburo; Tanabe, Yoshimitu; and Murakami, Hisamichi, 4,400,492, Cl. 525-506.000.
Oba, Masayuki; Kawamata, Motoo; Tsuboi, Hikotada; and Koga, Nobuhito, 4,400,521, Cl. 548-549.000.
Mitsuya, Munehisa; Terao, Motoyasu; Ota, Sakae; Taniguchi, Yoshio; Kaku, Toshimitsu; and Horigome, Shinkichi, to Hitachi, Ltd. Recording medium. 4,400,707, Cl. 346-135.100.
Mitutoyo Mfg. Co., Ltd.: *See*—
Yoshioka, Susumu, 4,399,617, Cl. 33-169.00R.
Mitzkus, Jurgen: *See*—
Stutz, Michael; and Mitzkus, Jurgen, 4,400,010, Cl. 280-732.000.
Miura, Yoshio: *See*—
Furuichi, Tokinori; Ikoma, Junichi; Oguri, Masao; Miura, Yoshio; and Shimizu, Keizo, 4,400,807, Cl. 369-220.000.
Miura, Yuzo; Katsuma, Makoto; and Suzuki, Masayuki, to Canon Kabushiki Kaisha. Finger abutment device for camera. 4,400,076, Cl. 354-202.000.
Miyahara, Junji: *See*—
Kotera, Noboru; Eguchi, Shusaku; Teraoka, Masanori; Takahashi, Kenji; and Miyahara, Junji, 4,400,619, Cl. 250-327.200.
Miyake, Masayoshi; Ueoka, Isao; and Kawaguchi, Munetaka, to Sumitomo Electric Industries, Ltd. Magnet wires. 4,400,430, Cl. 428-383.000.
Miyatake, Yoshito; Nagaoka, Yoshitomi; and Nakajima, Yasuo, to Matsushita Electric Industrial Co., Ltd. Optical configuration for projection television apparatus. 4,400,722, Cl. 358-60.000.
Miyo, Hiroaki: *See*—
Ohtsuka, Katsuyuki; Miyo, Hiroaki; and Hayashi, Daisaku, 4,400,604, Cl. 219-10.55M.
Mizuno, Yutaka: *See*—
Takahashi, Akio; Itoh, Yutaka; Shimazaki, Takeshi; Wajima, Motoyo; Morishita, Hirosada; Mizuno, Yutaka; Yokozawa, Shunya; and Tsukanishi, Kenji, 4,400,438, Cl. 428-458.000.
Mobay Chemical Corporation: *See*—
Chadwick, David H.; and Boyd, Thomas E., 4,400,538, Cl. 564-423.000.
Mobil Oil Corporation: *See*—
Chew, Ju-Nam, 4,400,034, Cl. 299-5.000.
Gentry, Larry L.; and Klootwyk, Ronald I., 4,400,109, Cl. 405-195.000.
Gournay, Luke S., 4,399,693, Cl. 73-152.000.
Horodysky, Andrew G.; and Kaminski, Joan M., 4,400,283, Cl. 252-32.70E.
Mitchell, Thomas O.; and Whitehurst, Darrell D., 4,400,561, Cl. 568-902.000.
Shen, Roderick C., 4,400,265, Cl. 208-97.000.
Zrinscak, Fred S., 4,400,307, Cl. 252-455.00Z.
Moerk, John C., Jr., to Felt Products Mfg. Co. Head gasket assembly for diesel engines. 4,400,000, Cl. 277-235.00B.
Mohr, Larry S.: *See*—
Chopp, Joseph A., Jr.; and Mohr, Larry S., 4,399,592, Cl. 24-25.000.
Molitor, Robert P., to Questor Corporation. Structural member having a high strength to weight ratio and method of making same. 4,399,992, Cl. 273-73.00F.
Mollen, Alfred; and Levine, Zelman, to Patent Investment Associates. Tape cassette holder. 4,399,912, Cl. 206-387.000.
Mollier, Pierre B.: *See*—
Bauge, Michel G.; and Mollier, Pierre B., 4,400,713, Cl. 357-45.000.
Molloy, Robert E. Osmometers. 4,400,096, Cl. 374-25.000.
Molnar, Robert, to Simnar, Inc. Automatic fish feeder and orientator. 4,399,588, Cl. 17-64.000.
Monaghen, Verlan D.: *See*—
Eisenberg, Jack; and Monaghen, Verlan D., 4,400,129, Cl. 414-462.000.

Monarch Marking Systems, Inc.: *See*—
Kessler, John R., 4,399,751, Cl. 101-348.000.
Money, David K., to Telectronics Pty. Ltd. Direct-coupled output stage for rapid-signal biological stimulator. 4,399,818, Cl. 128-419.0PG.
Mongini, Franco: *See*—
Preti, Giulio; and Mongini, Franco, 4,400,826, Cl. 378-178.000.
Mono Oakes Limited: *See*—
Stevenson, Christopher, 4,399,946, Cl. 241-21.000.
Monoconstruction Limited: *See*—
Eastwood, Owen, 4,399,985, Cl. 266-265.000.
Monosolar, Inc.: *See*—
Kroger, Ferdinand A.; Rod, Robert L.; and Panicker, M. P. Ramachandra, 4,400,244, Cl. 204-2.100.
Monsanto Company: *See*—
Arrant, Kearney D., 4,399,954, Cl. 242-86.520.
Bollinger, Wayne A.; and Guay, Roger G., 4,400,276, Cl. 210-323.200.
Ort, Morris R., 4,400,554, Cl. 568-727.000.
Robach, Michael C., 4,400,403, Cl. 426-532.000.
Montedison, S.p.A.: *See*—
Di Battista, Piero, 4,400,513, Cl. 546-16.000.
Gozzo, Franco; Boschi, Pier M.; and Longoni, Angelo, 4,400,517, Cl. 548-118.000.
Monterey Manufacturing, Inc.: *See*—
Hall, Charles P., 4,399,575, Cl. 5-450.000.
Montgomery, James W.: *See*—
Baugh, John L.; Montgomery, James W.; and Manderscheid, Phillip H., 4,399,870, Cl. 166-324.000.
Montigny, Joseph W.: *See*—
Gordon, Charles O., Jr., 4,400,269, Cl. 209-447.000.
Moore, Charles E. Dental mirror assembly. 4,400,157, Cl. 433-31.000.
Moore, Charles H. Hand tool with variable inclined head. 4,399,978, Cl. 254-26.00R.
Moore, David M.: *See*—
Muhler, Joseph C.; Kleber, Carl J.; Ream, Ronald L.; and Moore, David M., 4,400,372, Cl. 424-48.000.
Moore, Phillip M., to Motorola, Inc. Digital phase detector. 4,400,664, Cl. 324-83.00D.
Moore, Robert A.: *See*—
Daniel, Michael R.; Adam, John D.; and Moore, Robert A., 4,400,669, Cl. 333-141.000.
Moorhouse, John H. Auxiliary security lock assembly for a door. 4,399,672, Cl. 70-101.000.
Moran, Joseph M.: *See*—
Coquin, Gerald A.; Moran, Joseph M.; and Taylor, Gary N., 4,400,235, Cl. 156-643.000.
Morande, James A., Jr. Stove construction. 4,399,804, Cl. 126-77.000.
Moraw, Roland; and Schadlich, Renate, to Hoechst Aktiengesellschaft. Information carriers, method of forming and copying said carriers. 4,400,057, Cl. 350-162.200.
Morbitzer, Leo: *See*—
Kafer, Peter; Morbitzer, Leo; Nouvertne, Werner; and Neuray, Dieter, 4,400,491, Cl. 525-439.000.
Morca, Inc.: *See*—
Cruz, Mamerto M., Jr., 4,400,297, Cl. 252-378.00R.
Moreau, Jean-Pierre: *See*—
Biancale, Pierre; Corfa, Yves-Paul; Lemercier, Pierre; Moreau, Jean-Pierre; and Vertut, Jean, 4,400,115, Cl. 405-303.000.
Mori, Hiroshi; and Sugiki, Mikio, to Sony Corporation. Wave plate retarder. 4,400,062, Cl. 350-406.000.
Mori, Masashi: *See*—
Okuda, Shigeru; Mori, Masashi; and Hayase, Masahiro, 4,400,334, Cl. 264-30.000.
Mori, Sumio, to Fuji Photo Film Co., Ltd. Information processing system for a computer output microfilmer. 4,400,777, Cl. 364-200.000.
Morihara, Kazuyuki; Oka, Tatsushi; and Tsuzuki, Hiroshige, to Shionogi & Co., Ltd. Semi-synthesis of human insulin. 4,400,465, Cl. 435-71.000.
Morimoto, Masaaki; Kusakabe, Noboru; Kojima, Koichi; and Koyama, Eiichi, to Bridgestone Tire Co., Ltd. Metal cord-rubber composite materials. 4,399,853, Cl. 152-359.000.
Morin, Roland G.: *See*—
Cobb, Carleton M., III; Morin, Roland G.; and Hirsbrunner, Hans G., 4,400,677, Cl. 337-6.000.
Morishita, Hirosada: *See*—
Takahashi, Akio; Itoh, Yutaka; Shimazaki, Takeshi; Wajima, Motoyo; Morishita, Hirosada; Mizuno, Yutaka; Yokozawa, Shunya; and Tsukanishi, Kenji, 4,400,438, Cl. 428-458.000.
Morita, Kaoru: *See*—
Katsuragi, Shigeo; Morita, Kaoru; Kobari, Sadami; Noda, Toshiharu; Nakagawa, Nobuaki; and Watanabe, Susumu, 4,400,316, Cl. 260-112.50R.
Morley, Robert G.; and Ashton, W. Ronald, to Landwide Foods, Inc. Dietetic frozen dessert food. 4,400,405, Cl. 426-565.000.
Morley, Robert G.; and Ashton, W. Ronald, to Landwide Foods, Inc. Frozen dessert food. 4,400,406, Cl. 426-565.000.
Moroishi, Taishi: *See*—
Kudo, Takeo; Okada, Yasutaka; Moroishi, Taishi; Ikeda, Akio; Ohtani, Hiroo; and Yoshikawa, Kunihiko, 4,400,209, Cl. 420-443.000.
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Morris, George E.; and Woodward, Stewart A., to General Electric Company. Control device and method of making. 4,400,628, Cl. 307-118.000.
Morrison Machine Co.: *See*—
Stanislaw, Peter P.; and Hicks, James S., 4,400,238, Cl. 162-273.000.
Morrow, Gary W.: *See*—
Bishop, Clyde E.; and Morrow, Gary W., 4,400,550, Cl. 568-486.000.
Morrow, Stanley J.: *See*—
Henslee, Walter W.; Lindsey, John S.; Morrow, Stanley J.; Periard, John N.; and Whitworth, Charles R., 4,400,431, Cl. 428-402.000.
Moschetti, Anthony P.; Smith, J. Thomas; Quackenbush, Carr L. W.; Lingertat, Helmut; and Nehring, Vincent W., to GTE Laboratories Incorporated. Sintered silicon nitride ceramic articles having surface layers of controlled composition. 4,400,427, Cl. 428-332.000.
Mosley, William H., Jr.: *See*—
Chambers, Ramon P.; and Mosley, William H., Jr., 4,400,790, Cl. 364-604.000.
Mostosi, Angelo, to SACE S.p.A. Costruzioni Elettromeccaniche. Electric switch, more particularly a current-limiter. 4,400,670, Cl. 335-6.000.
Motomura, Toshiharu: *See*—
Noda, Kanji; Nakagawa, Akira; Motomura, Toshiharu; and Ide, Hiroyuki, 4,400,520, Cl. 548-472.000.
Motorola, Inc.: *See*—
Cave, David L.; Maulding, Gary L.; and Weber, Howard F., 4,400,756, Cl. 361-152.000.
Cho, Frederick Y.; and Williams, Dylan F., 4,400,640, Cl. 310-313.00A.
Kaman, Richard A.; Felix, Kenneth A.; Smanski, Philip J.; and Haug, John R., 4,400,585, Cl. 179-2.0EB.
Moore, Phillip M., 4,400,664, Cl. 324-83.00D.
Sumner, Terence E., 4,400,817, Cl. 375-119.000.
Vilmur, Richard J., 4,400,584, Cl. 179-1.0HF.
Mouri, Tomohiro, to Victor Company of Japan Ltd. Level detection circuit. 4,400,633, Cl. 307-351.000.
Moutard, Daniel: *See*—
Pierart, Robert; and Moutard, Daniel, 4,400,345, Cl. 376-292.000.
Moyer, Harold W., to Western Electric Company, Inc. Assembling an electronic device. 4,399,610, Cl. 29-827.000.
Mueller, Fredrick N.: *See*—
Brown, Henry C.; and Mueller, Fredrick N., 4,400,704, Cl. 346-29.000.
Muhler, Joseph C.; Kleber, Carl J.; Ream, Ronald L.; and Moore, David M., to Indiana University Foundation. Chewing gum. 4,400,372, Cl. 424-48.000.
Mukamal, Harold; Lamar, Richard S.; and Ferreira, Laurence E., to Standard Oil Company (Indiana). Rubber composition. 4,400,485, Cl. 524-444.000.
Mukoh, Akio: *See*—
Nagae, Yoshiharu; Ito, Tetsuo; Kitajima, Masaaki; Kawakami, Hideaki; Nakano, Fumio; Abe, Hidetoshi; Isogai, Masato; Ooue, Michio; and Mukoh, Akio, 4,400,059, Cl. 350-332.000.
Muller, Hanns P.: *See*—
Richter, Roland; Muller, Hanns P.; Wagner, Kuno; Helm, Rudolf; and Zander, Jurgen, 4,400,560, Cl. 568-863.000.
Muller, Hans, to Chemap AG. Method and an arrangement for feeding fish with a fodder. 4,400,399, Cl. 426-1.000.
Muller, Heinz: *See*—
Haas, Peter; Muller, Heinz; Seifert, Peter; Wagner, Kuno; Findeisen, Kurt; and Konig, Klaus, 4,400,331, Cl. 260-932.000.
Muller, Jakob, to Textilma AG. Method and device for the manufacture of a woven fabric and woven fabric manufactured according to the method. 4,399,841, Cl. 139-383.00R.
Muller, Karl-Heinz: *See*—
Dworak, Wilhelm; Muller, Karl-Heinz; Mayer, Siegfried; Talmon, Wolfgang; and Grabow, Kurt, 4,400,146, Cl. 418-131.000.
Muller, Wolfgang H. E.; and Hofmann, Peter, to Chemische Werke Huls AG. Method for recovering and reactivating cobalt catalysts used in the reaction of olefins with carbon monoxide and alkanols. 4,400,300, Cl. 252-414.000.
Mundo Corporation, The: *See*—
Appleby, Robert A., 4,399,832, Cl. 137-216.000.
Munger, Stanley H.: *See*—
Gruetzmacher, Robert R.; Munger, Stanley H.; and Warfield, Peter F., 4,400,459, Cl. 430-306.000.
Munson, Richard W., to Low Energy Homes, Inc. Insulation damming device. 4,400,766, Cl. 362-376.000.
Murakami, Hisamichi: *See*—
Asano, Makoto; Kawashima, Saburo; Tanabe, Yoshimitu; and Murakami, Hisamichi, 4,400,492, Cl. 525-506.000.
Murakami, Masahiro; and Aotsuka, Kazuo, to Sumitomo Precision Products Company Limited. Automatic fillet weld tracing mechanism. 4,400,610, Cl. 219-124.020.
Muralidhara, Ranya: *See*—
Pittet, Alan O.; Muralidhara, Ranya; and Vock, Manfred H., 4,400,390, Cl. 424-301.000.
Muramatsu, Akira: *See*—
Kurabe, Hyojiro; Muramatsu, Akira; and Makiguchi, Toshisada, 4,399,858, Cl. 164-16.000.

Murata Kikai Kabushiki Kaisha: *See*—
Kato, Hisaaki, 4,399,648, Cl. 57-265.000.

Murphy, John M.; Spensley, Robert H.; and Ellis, John, to Societe Anonyme d'Explosifs et de Produits Chimiques. Cartridge for use in anchor bolting. 4,399,911, Cl. 206-219.000.

Murphy, Joy: *See*—
Murphy, Paul D.; and Reph, Clinton A., 4,399,645, Cl. 52-743.000.

Murphy, Paul D.; and Reph, Clinton A., to Weitz, Lou; Ward, Jeriline; and Murphy, Joy, part interest to each. Bladder insulation. 4,399,645, Cl. 52-743.000.

Muto, Yukio: *See*—
Hiromasa, Syunichiro; Omori, Norio; Kawashima, Yutaka; and Muto, Yukio, 4,399,698, Cl. 73-204.000.

MWL Tool and Supply Company: *See*—
Lindsey, Hiram E., Jr., 4,399,873, Cl. 166-380.000.

Myers, Cory S.; Pirz, Frank C.; and Rabiner, Lawrence R., to Bell Telephone Laboratories, Incorporated. Continuous speech pattern recognizer. 4,400,788, Cl. 364-513.000.

MYL Developments Ltd.: *See*—
Yates, Herbert, 4,400,658, Cl. 320-26.000.

Nadler, Harry, to Rockwell International Corporation. Acoustically filtered transducer. 4,400,805, Cl. 367-140.000.

Nagae, Yoshiharu; Ito, Tetsuo; Kitajima, Masaaki; Kawakami, Hideaki; Nakano, Fumio; Abe, Hidetoshi; Isogai, Masato; Ooue, Michio; and Mukoh, Akio, to Hitachi, Ltd. Liquid crystal display device. 4,400,059, Cl. 350-332.000.

Nagao, Syuji; Nakai, Ryoichi; and Yamauchi, Kazuo, to Furuno Electric Co., Ltd. Moving body track indicator system. 4,400,780, Cl. 364-449.000.

Nagaoka, Yoshitomi: *See*—
Miyatake, Yoshito; Nagaoka, Yoshitomi; and Nakajima, Yasuo, 4,400,722, Cl. 358-60.000.

Nagarajan, Arunachala: *See*—
Barbee, Steven G.; Leas, James M.; Lloyd, James R.; and Nagarajan, Arunachala, 4,400,715, Cl. 357-49.000.

Nagler, Albert. Multi-purpose telescope. 4,400,065, Cl. 350-476.000.

Nahon, Abraham S. Recessed window lock. 4,400,027, Cl. 292-288.000.

Nair, K. Manikantan, to Du Pont de Nemours, E. I., and Company. Thick film silver compositions for silver terminations for reduced barium titanate capacitors. 4,400,310, Cl. 252-514.000.

Nakagawa, Akira: *See*—
Noda, Kanji; Nakagawa, Akira; Motomura, Toshiharu; and Ide, Hiroyuki, 4,400,520, Cl. 548-472.000.

Nakagawa, Nobuaki: *See*—
Katsuragi, Shigeo; Morita, Kaoru; Kobari, Sadami; Noda, Toshiharu; Nakagawa, Nobuaki; and Watanabe, Susumu, 4,400,316, Cl. 260-112.50R.

Nakai, Masaaki: *See*—
Izumi, Shuji; Sahara, Masayoshi; and Nakai, Masaaki, 4,400,691, Cl. 340-347.0AD.

Nakai, Ryoichi: *See*—
Nagao, Syuji; Nakai, Ryoichi; and Yamauchi, Kazuo, 4,400,780, Cl. 364-449.000.

Nakajima, Yasuo: *See*—
Miyatake, Yoshito; Nagaoka, Yoshitomi; and Nakajima, Yasuo, 4,400,722, Cl. 358-60.000.

Nakamura, Hiroshi: *See*—
Nozaki, Masaharu; Nakamura, Hiroshi; and Miki, Yusaku, 4,400,775, Cl. 364-200.000.

Nakane, Masanori: *See*—
Osumi, Yasuaki; Suzuki, Hiroshi; Kato, Akihiko; Oguro, Keisuke; and Nakane, Masanori, 4,400,348, Cl. 420-443.000.

Nakano, Fumio: *See*—
Nagae, Yoshiharu; Ito, Tetsuo; Kitajima, Masaaki; Kawakami, Hideaki; Nakano, Fumio; Abe, Hidetoshi; Isogai, Masato; Ooue, Michio; and Mukoh, Akio, 4,400,059, Cl. 350-332.000.

Nakayama, Yasuo. Light measuring circuit. 4,400,087, Cl. 356-215.000.

Nalewajek, David, to Allied Corporation. Recovery of gadolinium and gallium oxides. 4,400,360, Cl. 423-21.100.

Namyslo, Wilhelm, to Timex Corporation. Push button assembly for a watch. 4,400,095, Cl. 368-321.000.

Nanis, Leonard: *See*—
Advani, Gulu N.; Beard, Robert; and Nanis, Leonard, 4,399,684, Cl. 73-1.00G.

Narasaka, Shin: *See*—
Otsuka, Kazuo; Narasaka, Shin; and Hasegawa, Shumpei, 4,399,792, Cl. 123-489.000.

Naruo, Hideaki: *See*—
Wagatsuma, Yuuji; and Naruo, Hideaki, 4,400,608, Cl. 219-107.000.

National Distillers and Chemical Corporation: *See*—
Barlow, Anthony; and Maringer, Melvin F., 4,400,429, Cl. 428-379.000.
Brima, Thomas S.; and Cottingham, Auburn B., 4,400,324, Cl. 260-369.000.

National Research Development Corporation: *See*—
Albery, Wyndham J.; and Hahn, Clive E. W., 4,400,242, Cl. 204-1.00T.
Green, Geoffrey W.; and Lettington, Alan H., 4,400,410, Cl. 427-39.000.
Sanderson, Arnold R., 4,400,376, Cl. 424-88.000.

National Research Institute for Metals: *See*—
Kurabe, Hyojiro; Muramatsu, Akira; and Makiguchi, Toshisada, 4,399,858, Cl. 164-16.000.

National Starch and Chemical Corporation: *See*—
Silano, Michael A.; and Featherston, Robert D., 4,400,480, Cl. 524-47.000.

Natori, Mariko: *See*—
Ono, Kouzi; Kawasaki, Mikio; Natori, Mariko; and Sakamoto, Eiichi, 4,400,462, Cl. 430-415.000.

Navidyne Corporation: *See*—
Barker, A. Clifford, 4,399,714, Cl. 74-5.100.

Nawai, Takeo: *See*—
Aisaka, Tatsuyoshi; Kawai, Mituo; Hasegawa, Suteto; and Nawai, Takeo, 4,400,346, Cl. 376-327.000.

Nazarenko, Oleg K.: *See*—
Pastushenko, Jury I.; Spynu, Gleb A.; Nazarenko, Oleg K.; Lokshin, Viktor E.; and Shapoval, Vladimir I., 4,400,609, Cl. 219-121.0EV.

NCR Corporation: *See*—
Duley, Raymond S., 4,400,661, Cl. 323-275.000.
Schuck, David B., 4,400,049, Cl. 339-176.0MP.

Nederlandse Centrale Organisatie voor Toegepast Natuurwetenschappelijk Onder Zoek: *See*—
Arkenbout, Gerardus J.; van Kuijk, Albert; van der Meer, Johannes; and Schneiders, Leonardus H. J. M., 4,400,189, Cl. 62-538.000.

Neefe, Charles W. Production of oxygen permeable contact lenses. 4,400,333, Cl. 264-2.700.

Neff-Werke Carl Neff GmbH: *See*—
Baschin, Horst, 4,400,045, Cl. 312-236.000.

Nehring, Vincent W.: *See*—
Moschetti, Anthony P.; Smith, J. Thomas; Quackenbush, Carr L. W.; Lingertat, Helmut; and Nehring, Vincent W., 4,400,427, Cl. 428-332.000.

Neirinckx, Rudi D., to E. R. Squibb & Sons, Inc. Method and adsorbant composition for ^{82}Rb generation. 4,400,358, Cl. 423-2.000.

Nelder, Barbara L. Carton construction and method of making a cutting edge therefor. 4,399,935, Cl. 225-49.000.

Nelle, Gunther, to Dr. Johannes Heidenhain GmbH. Method and circuit for operating an incandescent lamp. 4,400,651, Cl. 315-205.000.

Nelson, Roger: *See*—
Severson, Sylvester B., 4,399,737, Cl. 98-6.000.

Nemet-Mavrodin, Margaret I.; and White, John F., to Atlantic Richfield Company. Recovery of 2-phenylethanol. 4,400,558, Cl. 568-810.000.

Neumann Equipment Marketing Co. Pty. Ltd.: *See*—
Neumann, John A., 4,399,623, Cl. 37-73.000.

Neumann, John A., to Neumann Equipment Marketing Co. Pty. Ltd. Dredges. 4,399,623, Cl. 37-73.000.

Neuray, Dieter: *See*—
Kafer, Peter; Morbitzer, Leo; Nouvertne, Werner; and Neuray, Dieter, 4,400,491, Cl. 525-439.000.

Nevamar Corporation: *See*—
Scher, Herbert I.; and Ungar, Israel S., 4,400,423, Cl. 428-204.000.

New England Power Service Company: *See*—
Johnston, Reed H.; Jeffreys, Dennis C.; Stratton, Lawrence J.; and Welz, Albert W., Jr., 4,400,688, Cl. 340-310.00R.

Newsome, John R.: *See*—
Kwant, Pieter B.; and Newsome, John R., 4,400,264, Cl. 208-68.000.

Nezu, Takao, to Konishiroku Photo Industry Co., Ltd. Sheet supplying apparatus. 4,400,085, Cl. 355-76.000.

Ng, Thomas K.: *See*—
Zeikus, Joseph G.; Ng, Thomas K.; Ben-Bassat, Arie; and Lamed, Raphael J., 4,400,470, Cl. 435-162.000.

NGK Spark Plug Co., Ltd.: *See*—
Nishio, Kanemitsu; Takagi, Shunichi; and Suzuki, Yasuhiko, 4,400,643, Cl. 313-11.500.

Nichiryo Co., Ltd.: *See*—
Oshikubo, Yuji; and Tanabe, Sadakazu, 4,399,712, Cl. 73-864.160.

Nicholson, R. Kent: *See*—
Rodowsky, Stanley, Jr.; and Nicholson, R. Kent, 4,399,638, Cl. 51-170.00R.

Nicolas, Francois: *See*—
Maurel, Pierre; and Nicolas, Francois, 4,400,359, Cl. 423-15.000.

Nielsen, Dean M., to Safeway Stores, Incorporated. Refrigeration system with carbon dioxide injector. 4,399,658, Cl. 62-52.000.

Niemeier, Byron M.: *See*—
Wedertz, Larry D.; Niemeier, Byron M.; and Ross, Oakley G., 4,399,962, Cl. 244-3.230.

Nilsson, Erling I., to Tetra Pak Developpement SA. Cap. 4,399,924, Cl. 220-257.000.

Ninomiya, Yoshinobu: *See*—
Konishi, Shin; Yoshida, Mitsuhiro; Katagiri, Masatake; Somezawa, Masashi; Ninomiya, Yoshinobu; and Hashimoto, Akira, 4,400,498, Cl. 528-60.000.

Nippon Cable System Inc.: *See*—
Kobayashi, Tetuo; and Hagiwara, Noboru, 4,399,901, Cl. 192-111.00A.

Nippon Electric Co., Ltd.: *See*—
Ishikawa, Masashi; Shimada, Masatoshi; Okamoto, Katsutomo; Sugita, Shigeyoshi; Goto, Masayuki; Koizumi, Yukuo; and Kaneda, Osamu, 4,400,782, Cl. 364-481.000.

Nippon Gakki Seizo Kabushiki Kaisha: *See*—
Aoki, Eiichiro, 4,399,731, Cl. 84-1.030.

Nippon Hoso Kyokai: *See*—
Sekiguchi, Takuji, 4,400,666, Cl. 328-130.100.

Nippon Kogaku K.K.: *See*—
Hayashida, Bun, 4,400,063, Cl. 350-415.000.

Nippon Oil Company, Ltd.: *See*—
Fujiso, Tokuo; Nomura, Soichi; and Ohmori, Tadashi, 4,400,574, Cl. 585-671.000.

Nippon Polyurethane Industry Co., Ltd.: *See*—
Konishi, Shin; Yoshida, Mitsuhiro; Katagiri, Masatake; Somezawa, Masashi; Ninomiya, Yoshinobu; and Hashimoto, Akira, 4,400,498, Cl. 528-60.000.
Nippon Seiko Kabushiki Kaisha: *See*—
Mita, Akira, 4,399,956, Cl. 242-107.200.
Nippon Soken, Inc.: *See*—
Kohama, Tokio; Obayashi, Hideki; Kawai, Hisasi; and Egami, Tsuneyuki, 4,399,697, Cl. 73-204.000.
Matsumoto, Muneaki; Kuno, Akira; and Numata, Koji, 4,399,615, Cl. 33-361.000.
Nippon Telegraph & Telephone Public Corporation: *See*—
Takeuchi, Yoshinobu; Kuroda, Katsuhiro; and Ozasa, Susumu, 4,400,622, Cl. 250-396.0ML.
Nippon Zeon Co. Ltd.: *See*—
Iwata, Riso; and Wada, Akira, 4,400,486, Cl. 525-57.000.
Nippondenso Co., Ltd.: *See*—
Hiromasa, Syunichiro; Omori, Norio; Kawashima, Yutaka; and Muto, Yukio, 4,399,698, Cl. 73-204.000.
Kosuge, Shuichi; Ogura, Hiroshi; Arai, Hiroshi; and Ohta, Hisatoshi, 4,400,779, Cl. 364-442.000.
Tsukasaki, Hidaka, 4,399,781, Cl. 123-179.00H.
Nishikata, Goro; and Shibukawa, Kozo, to Kabushiki Kaisha Mitutoyo Seisakusho. Two-leg vernier calipers and its manufacturing method. 4,399,613, Cl. 33-143.00M.
Nishio, Kanemitsu; Takagi, Shunichi; and Suzuki, Yasuhiko, to NGK Spark Plug Co., Ltd. Wide thermal range spark plug. 4,400,643, Cl. 313-11.500.
Nishizawa, Jun-ichi; Ohmi, Tadahiro; and Takahashi, Keishiro, to Zaidan Hojin Handotai Kenkyu Shinkokai. Semiconductor device. 4,400,710, Cl. 357-15.000.
Nishizawa, Tetsuo: *See*—
Akiyama, Kazuhiko; Yoshino, Takeshi; Shiina, Michihiro; Sato, Shigeo; Nishizawa, Tetsuo; Yoshida, Toshio; and Kobayashi, Nobuo, 4,400,074, Cl. 354-173.000.
Nissan Motor Co., Ltd.: *See*—
Endo, Hiroshi; and Baba, Kousaku, 4,399,779, Cl. 123-146.50A.
Fujishiro, Takeshi, 4,399,699, Cl. 73-304.00C.
Kanamori, Hiroshi; and Kanazawa, Takeshi, 4,400,417, Cl. 428-31.000.
Kataoka, Ryuji, 4,399,790, Cl. 123-440.000.
Matsuno, Yoshio, 4,400,011, Cl. 280-748.000.
Oshiage, Katsunori; and Hosaka, Akio, 4,399,802, Cl. 123-609.000.
Otsuka, Hidehiro, 4,400,012, Cl. 280-777.000.
Takei, Hirofumi, 4,399,974, Cl. 248-605.000.
Tsutsumi, Saburo, 4,399,774, Cl. 123-41.100.
Yano, Tsuneomi, 4,399,789, Cl. 123-340.000.
Yaotani, Kouichi; Yoshida, Minoru; and Arisaka, Oomi, 4,399,927, Cl. 220-307.000.
Nitta, Hideo: *See*—
Asano, Hiroshi; Shimamune, Takayuki; Goto, Toshiki; Nitta, Hideo; and Hosonuma, Masashi, 4,400,408, Cl. 427-35.000.
Nix, Maria, born Saxler, to Nix, Norbert. Device for automatically measuring thickness of coatings on a substrate by comparison with an uncoated substrate. 4,400,665, Cl. 324-230.000.
Nix, Norbert: *See*—
Nix, Maria, born Saxler, 4,400,665, Cl. 324-230.000.
NL Sperry Sun, Inc.: *See*—
Jackson, Joshua M.; and Koval, Vernon E., 4,399,877, Cl. 175-45.000.
Nobel, Fred I.: *See*—
Kessler, Richard B.; and Nobel, Fred I., 4,400,415, Cl. 427-305.000.
Noda, Kanji; Nakagawa, Akira; Motomura, Toshiharu; and Ide, Hiroyuki, to Hisamitsu Pharmaceutical Co., Inc. Novel process for preparing isoindoline derivatives. 4,400,520, Cl. 548-472.000.
Noda, Toshiharu: *See*—
Katsuragi, Shigeo; Morita, Kaoru; Kobari, Sadami; Noda, Toshiharu; Nakagawa, Nobuaki; and Watanabe, Susumu, 4,400,316, Cl. 260-112.50R.
Nodet - Gougis: *See*—
Maury, Jean-Pierre, 4,399,757, Cl. 111-34.000.
Noguchi, Kiyoshi: *See*—
Izumi, Toshiaki; Maruta, Fumio; Kobuke, Takayoshi; and Noguchi, Kiyoshi, 4,400,444, Cl. 428-694.000.
Nokin, Pierre: *See*—
Rosseels, Gilbert; and Nokin, Pierre, 4,400,387, Cl. 424-263.000.
Nola, Frank J., to United States of America, National Aeronautics and Space Administration. Triac failure detector. 4,400,657, Cl. 318-798.000.
Nolf, Jean-Marie E., to N.V. Raychem S.A. Branch-off assembly. 4,400,579, Cl. 174-854.00R.
Nomtak, Ants. Vessel for molten metal. 4,399,981, Cl. 266-275.000.
Nomura, Soichi: *See*—
Fujiso, Tokuo; Nomura, Soichi; and Ohmori, Tadashi, 4,400,574, Cl. 585-671.000.
Nordson Corporation: *See*—
Lee, Cleve L., 4,400,612, Cl. 219-405.000.
Norlander, Lars G.: *See*—
Karlsson, Harry L.; and Norlander, Lars G., 4,399,878, Cl. 175-227.000.
North American Philips Consumer Electronics Corp.: *See*—
Palty, George, 4,400,647, Cl. 313-355.000.
Northern Telecom Limited: *See*—
Lee, Pok F., 4,400,718, Cl. 358-13.000.
Nouvertne, Werner: *See*—
Kafer, Peter; Morbitzer, Leo; Nouvertne, Werner; and Neuray, Dieter, 4,400,491, Cl. 525-439.000.
Nowakowski, Karol L. Quality control process. 4,399,849, Cl. 144-364.000.
Noyori, Tatsuhiko; Ueda, Masakazu; Aoki, Masanobu; Kajima, Takashi; and Masuda, Tsuneharu, to Kabushiki Kaisha Kobe Seiko Sho. Mandrel cleaning device for extrusion press. 4,399,676, Cl. 72-40.000.
Nozaki, Masaharu; Nakamura, Hiroshi; and Miki, Yusaku, to Tokyo Shibaura Denki Kabushiki Kaisha. Shared system for shared information at main memory level in computer complex. 4,400,775, Cl. 364-200.000.
NSK-Warner K.K.: *See*—
Imai, Hironobu, 4,400,013, Cl. 280-801.000.
Nuclear Power Outfitters: *See*—
Jacobson, Earl B., 4,400,623, Cl. 250-517.100.
Numata, Koji: *See*—
Matsumoto, Muneaki; Kuno, Akira; and Numata, Koji, 4,399,615, Cl. 33-361.000.
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Isono, Masaru; Nunokawa, Kazuo; Kondo, Masayuki; and Takada, Shinzo, 4,400,070, Cl. 354-25.000.
N.V. Raychem S.A.: *See*—
Nolf, Jean-Marie E., 4,400,579, Cl. 174-854.00R.
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Fredin, Bo; and Nylund, Olov, 4,400,347, Cl. 376-333.000.
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Kober, Marvin; and Battaglia, Eugene, 4,399,844, Cl. 140-106.000.
Oba, Masayuki; Kawamata, Motoo; Tsuboi, Hikotada; and Koga, Nobuhito, to Mitsui Toatsu Chemicals, Incorporated. N-Substituted phenyl maleimides. 4,400,521, Cl. 548-549.000.
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O'Brien, Thomas M., to Burroughs Corporation. Camming platen endorser. 4,399,750, Cl. 101-245.000.
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Geldner, Joachim; Rones, Josef; and Danzel, Horst, 4,400,289, Cl. 252-142.000.
Tomaszewski, Lillie C., 4,400,248, Cl. 204-146.000.
O'Connor, Kevin J., to Bell Telephone Laboratories, Incorporated. Static bipolar random access memory. 4,400,712, Cl. 357-44.000.
O'Connor, Terence A., to Teledyne Republic Manufacturing. Dual drive pump. 4,400,143, Cl. 417-374.000.
Oda, Noriyuki: *See*—
Tomita, Yukio; Wakabayashi, Takayuki; Oda, Noriyuki; and Yamamoto, Hirotaka, 4,400,184, Cl. 55-106.000.
O'Dell, William R.; and Fletcher, Christine M., to General Electric Company. Axial tomography head holder. 4,400,820, Cl. 378-209.000.
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Tomory, Ronald S.; and Odorczyk, James M., 4,400,738, Cl. 358-283.000.
Oeda, Yoshitaka, to Kanzaki Paper Mfg. Co., Ltd. Thermal recording paper. 4,400,437, Cl. 428-447.000.
Off, Joseph W. A.; and Early, Judson H., to Haggar Company. Garment welt folder. 4,400,165, Cl. 493-457.000.
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Biddle, Howard W., 4,399,938, Cl. 227-132.000.
Ogasawara, Hirotake, to Yoshida Industry Co., Ltd. Vanity case. 4,399,826, Cl. 132-83.00R.
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Ogata, Yasuhiro, to Kabushiki Kaisha Komatsu Seisakusho. Electro-hydraulic brake system having electric control means. 4,400,039, Cl. 303-3.000.
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Ogawa, Yasuhiro; Shida, Sankichi; Honjo, Katsuhiko; and Todoroki, Tsunehiko, to Matsushita Electric Industrial, Co., Ltd. Conductive paste. 4,400,214, Cl. 106-1.130.
Ogden, Ralph. Beverage carbonator device. 4,399,744, Cl. 99-323.100.
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Katagiri, Masayoshi; Ogura, Osamu; and Fujii, Takashi, 4,399,735, Cl. 91-369.00B.
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Furuichi, Tokinori; Ikoma, Junichi; Oguri, Masao; Miura, Yoshio; and Shimizu, Keizo, 4,400,807, Cl. 369-220.000.
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Ohman, Thor, to Graber Industries, Inc. Dual curtain rod assembly. 4,399,917, Cl. 211-87.000.
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Ozeki, Takeshi; and Ohshima, Shigeru, 4,400,055, Cl. 350-96.150.
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Hashimoto, Mitsuru; Sakai, Kiyoshi; Ohta, Katsunari; and Kojima, Akio, 4,400,455, Cl. 430-59.000.
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Yamamitsu, Chojuro; Arimura, Ichiro; and Ohtsu, Masamitsu, 4,400,742, Cl. 358-318.000.
Ohtsuka, Katsuyuki; Miyo, Hiroaki; and Hayashi, Daisaku, to Doryokuro Kakunenryo Kaihatsu Jigyodan. Heat treating method and apparatus using microwave. 4,400,604, Cl. 219-10.55M.
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Itoh, Testuro; Oizumi, Toshiro; and Yamada, Shigeo, 4,400,606, Cl. 219-69.00M.
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Morihara, Kazuyuki; Oka, Tatsushi; and Tsuzuki, Hiroshige, 4,400,465, Cl. 435-71.000.
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Ishikawa, Masashi; Shimada, Masatoshi; Okamoto, Katsutomo; Sugita, Shigeyoshi; Goto, Masayuki; Koizumi, Yukuo; and Kaneda, Osamu, 4,400,782, Cl. 364-481.000.
Okamoto, Toyoo: *See—*
Yamashita, Tadashi; and Okamoto, Toyoo, 4,400,081, Cl. 355-15.000.
Okonite Company, The: *See—*
Macchia, John L., 4,399,953, Cl. 242-47.080.
Okuda, Shigeru; Mori, Masashi; and Hayase, Masahiro, to Shinagawa Refractories Co., Ltd. Apparatus for making hearth of kiln under vibration. 4,400,334, Cl. 264-30.000.
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Rittenbach, Otto E.; and Olesch, Reinhard G., 4,400,695, Cl. 340-566.000.
Oliphant, Jean R.: *See—*
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Olmstead, H. Wayne, to Tektronix, Inc. Resonant scan deflection circuit with flyback voltage limiting. 4,400,653, Cl. 315-408.000.
Olschewski, Armin; Brandenstein, Manfred; Walter, Lothar; and Kunkel, Heinrich, to SKF Kugellagerfabriken GmbH. Device for releasably securing a shaft in a hub. 4,399,898, Cl. 198-98.000.
Olsson, Curt S.: *See—*
Jorgensen, Karl G.; Magnusson, Leif L.; and Olsson, Curt S., 4,399,745, Cl. 100-2.000.
OMEGA Louis Brandt & Frere S.A.: *See—*
Jaunin, Jean-Pierre, 4,400,093, Cl. 368-200.000.
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Hiromasa, Syunichiro; Omori, Norio; Kawashima, Yutaka; and Muto, Yukio, 4,399,698, Cl. 73-204.000.
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O'Neill, Michael J.; Brautigam, Peter F.; and Stricker, David K., to Deere & Company. Control mechanism for a dual hydrostatic transmission vehicle drive system. 4,399,882, Cl. 180-6.480.
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Sami, Shunsuke; Sugie, Akihiko; Ono, Keiichi; Kawakami, Hajime; Kojima, Atsuyuki; and Katsube, Junki, 4,400,393, Cl. 424-305.000.
Ono, Kouzi; Kawasaki, Mikio; Natori, Mariko; and Sakamoto, Eiichi, to Konishiroku Photo Industry Co., Ltd. Method for the formation of photographic images. 4,400,462, Cl. 430-415.000.
Ono, Susumu: *See—*
Kondo, Tadasige; Ono, Susumu; and Takata, Kenichi, 4,399,801, Cl. 123-603.000.
Ootsu, Yoshiro; and Arima, Yaeno, to Loire Cosmetics Co., Ltd. Emulsifier composition. 4,400,295, Cl. 252-356.000.
Ooue, Michio: *See—*
Nagae, Yoshiharu; Ito, Tetsuo; Kitajima, Masaaki; Kawakami, Hideaki; Nakano, Fumio; Abe, Hidetoshi; Isogai, Masato; Ooue, Michio; and Mukoh, Akio, 4,400,059, Cl. 350-332.000.
Original Hanau Heraeus GmbH: *See—*
Kochem, Winfried, 4,400,765, Cl. 362-277.000.
Orlowski, Jan A.; Butler, David V.; and Kidd, Patrick D., to Scientific Pharmaceuticals, Inc. Adducts of 3-methacroyl-2-hydroxypropyl esters with diisocyanates. 4,400,159, Cl. 433-202.000.
O'Rourke, Thomas W.: *See—*
Ingalls, William E., 4,400,007, Cl. 280-661.000.
Orr, Alexander F.; and Barker, Michael D., to Shell Oil Company. Herbicidal tetrahydrofuran derivatives. 4,400,198, Cl. 71-88.000.
Ort, Morris R., to Monsanto Company. Process for making bis(hydroxyphenyl)methanes. 4,400,554, Cl. 568-727.000.
Oshiage, Katsunori; and Hosaka, Akio, to Nissan Motor Company, Limited. Ignition energy control method and system. 4,399,802, Cl. 123-609.000.
Oshikubo, Yuji; and Tanabe, Sadakazu, to Nichiryo Co., Ltd. Semi-automatic electro-mechanical pipette with controlled tip remover. 4,399,712, Cl. 73-864.160.
Ostermaier, Albert E., to Flomar Enterprises. Strap lock device. 4,399,594, Cl. 24-201.00A.
Osumi, Yasuaki; Suzuki, Hiroshi; Kato, Akihiko; Oguro, Keisuke; and Nakane, Masanori, to Agency of Industrial Science & Technology; and Ministry of International Trade & Industry. Alloy for occlusion of hydrogen. 4,400,348, Cl. 420-443.000.
Oswalt, Harry L., Jr. Floating angle knife for metal working machines. 4,399,730, Cl. 83-579.000.
Ota, Sakae: *See—*
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Otis Engineering Corporation: *See—*
Adkins, Joel E.; Stout, Gregg W.; and Johnston, Russell A., 4,399,871, Cl. 166-325.000.
Otsuka, Hidehiro, to Nissan Motor Company, Limited. Steering column covering shell structure. 4,400,012, Cl. 280-777.000.
Otsuka, Kazuo; Narasaka, Shin; and Hasegawa, Shumpei, to Honda Motor Co., Ltd. Air/fuel ratio control system for internal combustion engines, having engine warming-up detecting means. 4,399,792, Cl. 123-489.000.
Otto, Dennis L., to Timken Company, The. Self-venting seal lip. 4,399,998, Cl. 277-134.000.
Outboard Marine Corporation: *See—*
Blanchard, Clarence E., 4,400,163, Cl. 440-75.000.
Lassanske, George G.; and Poehlman, Arthur G., 4,399,780, Cl. 123-146.50A.
Weindelmayer, Frederick G., 4,399,800, Cl. 123-592.000.
Ovshinsky, Stanford R.: *See—*
Izu, Masatsugu; Cannella, Vincent D.; and Ovshinsky, Stanford R., 4,400,409, Cl. 427-39.000.
Owen, David P., to Marconi Instruments Limited. Frequency multipliers. 4,400,630, Cl. 307-219.100.
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Dunn, Charles S.; and Seng, Stephen, 4,400,815, Cl. 373-92.000.
Gentry, Gary F., 4,400,228, Cl. 156-144.000.
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Farkas, Daniel S., 4,400,192, Cl. 65-29.000.
Frissora, Joseph R.; and Platt, Michael H., 4,399,808, Cl. 126-420.000.
Kusz, Maximillian, 4,399,921, Cl. 215-218.000.
Swartzbaugh, Peter T.; and Harbauer, Paul W., 4,399,920, Cl. 215-211.000.
Ownby, Paul D.; and Grayson, Paul E., to Eagle-Picher Industries, Inc. Control of oxygen- and carbon-related crystal defects in silicon processing. 4,400,232, Cl. 156-601.000.
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Closson, Thomas A.; Oxford, David B.; Schenck, Stephen R.; and Seitchik, Jerold A., 4,400,796, Cl. 365-8.000.
OY Tampella AB: *See—*
Tienari, Ossi, 4,399,876, Cl. 173-147.000.
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Webster, Donald R., 4,400,086, Cl. 356-36.000.

Page, Joseph V.; and Hanneken, Henry P., to PPG Industries, Inc. Ceramic rolls with metal end caps. 4,399,598, Cl. 29-115.000.

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Palm, John W., to Standard Oil Company (Indiana). Apparatus and process for recovering heat emanating from the shell of a thermal reactor in a sulfur recovery plant. 4,400,369, Cl. 423-574.00R.

Palmer, Ronald S.: *See*—
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Ray, Ranjan; and Panchanathan, Viswanathan, 4,400,212, Cl. 75-251.000.

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Chopp, Joseph A., Jr.; and Mohr, Larry S., 4,399,592, Cl. 24-25.000.

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Kroger, Ferdinand A.; Rod, Robert L.; and Panicker, M. P. Ramachandra, 4,400,244, Cl. 204-2.100.

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Buechel, Frederick F.; Pappas, Michael J.; and Witte, Paul A., 4,400,168, Cl. 604-48.000.

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Mollen, Alfred; and Levine, Zelman, 4,399,912, Cl. 206-387.000.

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Galland, Frank J., 4,400,106, Cl. 400-617.000.

Pavlick, Michael J.: *See*—
Krull, Joseph A.; and Pavlick, Michael J., 4,400,121, Cl. 410-64.000.

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Cohen, Barry J.; Scaramuzza, Joseph; and Tock, Graham, 4,399,943, Cl. 239-125.000.

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Wiknich, Douglas D.; and Peabody, Michael J., 4,399,907, Cl. 198-718.000.

Pedersen, Jan B., to Tortrix A/S. Magazine for winding wire on endless annular members or cores. 4,399,950, Cl. 242-4.00B.

Pendergrass, Russell G. Integrated budget and check record book. 4,400,017, Cl. 283-66.00A.

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Penn, William B.; and Reynolds, Kenneth R., to General Electric Company. Winding form for dynamoelectric machine. 4,399,949, Cl. 242-1.000.

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Clark, Roger T.; and Gardner, David M., 4,400,304, Cl. 252-430.000.

Penrod, Orville R.: *See*—
Bartley, John E.; and Penrod, Orville R., 4,400,762, Cl. 361-402.000.

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Henslee, Walter W.; Lindsey, John S.; Morrow, Stanley J.; Periard, John N.; and Whitworth, Charles R., 4,400,431, Cl. 428-402.000.

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Culmo, Robert F., 4,400,354, Cl. 422-78.000.

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Asano, Hiroshi; Shimamune, Takayuki; Goto, Toshiki; Nitta, Hideo; and Hosonuma, Masashi, 4,400,408, Cl. 427-35.000.

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Doetsch, Werner; Honig, Helmut; and Siegel, Rudolf, 4,400,367, Cl. 423-463.000.

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Vivian, John; Cooper, Patrick R.; Higgins, Ronald B.; Harlan, John A.; Perry, Paul M.; Vallhonrat, Juan B.; and Golden, Donald P., Jr., 4,400,778, Cl. 364-200.000.

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Peters, Rex B.: *See*—
Hulsing, Rand H., II; and Peters, Rex B., 4,399,692, Cl. 73-151.000.

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Severson, Sylvester B., 4,399,737, Cl. 98-6.000.

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Durand, William W.; and Peterson, Ronald E., 4,400,058, Cl. 350-166.000.

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De Souza Dias, Edson; Santos, Luiz D. D.; Teixeira, Joao C.; Amorin, Osvaldo; and Lamprecht, Antonio R. D. A., 4,399,846, Cl. 141-192.000.

Peyton, Ralph B. Underwater sensing mechanism and method. 4,399,695, Cl. 73-185.000.

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Greller, Peter, 4,400,124, Cl. 414-43.000.

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Johnson, Michael R., 4,400,385, Cl. 424-258.000.

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Buxbaum, Gunter; Pflugmacher, Ingo; Hund, Franz; Hahnkamm, Volker; and Woditsch, Peter, 4,400,432, Cl. 428-403.000.

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Funk, Gary L.; Huang, Warren H.; and Stewart, William S., 4,400,784, Cl. 364-500.000.
Hobbs, James W., 4,400,239, Cl. 196-132.000.
Johnson, Marvin M.; and Tabler, Donald C., 4,400,564, Cl. 585-845.000.
Lindstrom, Merlin R.; Louthan, Rector P.; and Macdonell, Gary D., 4,400,312, Cl. 252-545.000.
Martin, Joel L., 4,400,303, Cl. 252-429.00B.
Siedenstrang, Roy W.; and Cornell, William H., 4,400,483, Cl. 524-247.000.

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Dennis, William H., 4,399,688, Cl. 73-23.100.

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Theurer, Josef; and Pichler, Johann, 4,399,753, Cl. 104-7.00B.

Pickett, Teddy L.; and Edwards, Jerry L., to United States of America, Agriculture. Earth anchor apparatus and method. 4,400,114, Cl. 405-303.000.

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Malinowski, Hans; Pielsticker, Klaus-Peter; and Linsinger, Ernst, 4,399,729, Cl. 83-455.000.

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Pietro Laverda S.p.A.: *See*—
Raineri, Giuseppe, 4,399,825, Cl. 130-27.00S.

Pietsch, Helge, to Gebr. Isringhausen. Seat with a back rest and arm rest. 4,400,033, Cl. 297-417.000.

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Cross, Raymond P.; and Simpkin, Gordon T., 4,400,193, Cl. 65-114.000.

Pinhas, Henri: *See*—
Favier, Colette; Pinhas, Henri; Beranger, Serge; and Pascal, Jean-Claude, 4,400,381, Cl. 424-248.520.

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Kamimura, Teturo; Komatsubara, Masahiro; Ando, Shizuo; Inanaga, Takuzi; and Takahashi, Akira, 4,400,744, Cl. 360-69.000.

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Pissiotas, Georg; and Rohr, Otto, to Ciba-Geigy Corporation. m-Cyanoalkoxy-phenylureas having herbicidal activity. 4,400,205, Cl. 71-105.000.

Pitcher, Arnold, to Colvern Limited. Variable electrical resistance device. 4,400,686, Cl. 338-184.000.

Pittet, Alan O.; Muralidhara, Ranya; and Vock, Manfred H., to International Flavors & Fragrances Inc. Methyl-thio-2-methyl-2-pentenoates. 4,400,390, Cl. 424-301.000.

Pitts, Warren R., to Dennison Manufacturing Company. Suspension files and binders. 4,400,107, Cl. 402-4.000.

Plastic Oddities, Inc.: *See*—
Izzi, Lewis B., Sr., 4,399,743, Cl. 98-122.000.

Platt, Michael H.: *See*—
Frissora, Joseph R.; and Platt, Michael H., 4,399,808, Cl. 126-420.000.

Pledger, Huey, Jr.: *See*—
Butler, George B.; Hogen-Esch, Thieo E.; Meister, John J.; and Pledger, Huey, Jr., 4,400,496, Cl. 527-312.000.

Poehlman, Arthur G.: *See*—
Lassanske, George G.; and Poehlman, Arthur G., 4,399,780, Cl. 123-146.50A.

Pohl, Ludwig: *See*—
Romer, Michael; Krause, Joachim; and Pohl, Ludwig, 4,400,293, Cl. 252-299.630.

Pokorny, John M.: *See*—
Joyce, Tom B., 4,399,571, Cl. 5-13.000.

Pokorny, Louis, Jr.: *See*—
Joyce, Tom B., 4,399,571, Cl. 5-13.000.

Polaroid Corporation: *See*—
Bruder, Alan H., 4,400,452, Cl. 429-152.000.

Pollard, Ian E.; and Hawkins, Keith C., to United Kingdom of Great Britain and Northern Ireland, The Secretary of State for Industry in Her Britannic Majesty's Government of the. Electrostatic dispersal of liquids. 4,400,332, Cl. 261-1.000.

Pollman, Frederic W., to Sundstrand Corporation. Controls for variable displacement motor and motors. 4,399,886, Cl. 180-197.000.

Pont A Mousson S.A.: *See*—
Ackermann, Luc, 4,400,208, Cl. 75-129.000.

Poore, Bernard B.; and May, Charles W., to Deere & Company. Fuel injector. 4,399,793, Cl. 123-502.000.

Popelish, John A., to General Electric Company. Temperature controller for a fusing roller. 4,400,613, Cl. 219-497.000.

Porter, Michael W. Thermal insulation device. 4,399,640, Cl. 52-202.000.

Portz, Willi: *See*—
Braun, Albert; Portz, Willi; Strauss, Georg; and Delhey, Hans-Martin, 4,400,292, Cl. 252-189.000.

Posnansky, Mario; and Utiger, Urs, to Posnansky, Mario. Vacuum flask. 4,399,919, Cl. 215-13.00R.

Poss, Robert: *See*—
Pratt, George W., Jr.; Poss, Robert; and Lane, Timothy T., 4,399,814, Cl. 128-92.00C.

Poujol, Yves, to Valeo. Heating control cock. 4,399,838, Cl. 137-625.290.

Powell, Kenneth D.: *See*—
Rangachar, Hemmige V.; and Powell, Kenneth D., 4,400,233, Cl. 156-626.000.

Powers, Kerns H., to RCA Corporation. Television display system with reduced line-scan artifacts. 4,400,719, Cl. 358-21.00R.

Pozzi Window Company, Inc.: *See*—
Blackwell, Donald W., 4,399,636, Cl. 49-469.000.

PPG Industries, Inc.: *See*—
Breininger, J. Shannon; and Greenberg, Charles B., 4,400,436, Cl. 428-434.000.
Farabaugh, Aloysius W., 4,400,089, Cl. 356-382.000.
Grove, William S., deceased, 4,400,530, Cl. 560-21.000.
Page, Joseph V.; and Hanneken, Henry P., 4,399,598, Cl. 29-115.000.
Rinehart, Jay K., 4,400,197, Cl. 71-88.000.
Scanlon, J. Kevin; and Greenberg, Charles B., 4,400,412, Cl. 427-87.000.
Starr, Eugene W., 4,400,194, Cl. 65-114.000.
Stoneberg, Richard L.; and Stec, Raymond R., 4,400,487, Cl. 525-199.000.

Prang, Josef-Elmar: *See*—
Jandl, Erwin; and Prang, Josef-Elmar, 4,400,598, Cl. 200-16.00D.

Pratt, George W., Jr.; Poss, Robert; and Lane, Timothy T., to Massachusetts Institute of Technology. Method and apparatus for pressure-coated bones. 4,399,814, Cl. 128-92.00C.

Prestridge, Floyd L.; Schuetz, Adolph A.; and Wheeler, Harry L, to Combustion Engineering, Inc. Voltage control system for electrostatic oil treater. 4,400,253, Cl. 204-186.000.

Preti, Giulio; and Mongini, Franco. Craniostatic positioner, particularly for the ambulatorial radiography of the temporal-mandibular articulation. 4,400,826, Cl. 378-178.000.

Preuhs, Hans-Jurgen, to W. Schlafhorst & Co. Coil changing device. 4,399,951, Cl. 242-18.0DD.

Price, Harry S., III; and Brooks, Frank W., to Flexiblast Company. Apparatus for mechanical descaling of steel wire. 4,399,677, Cl. 72-40.000.

Printck, Inc.: *See*—
Yeager, Thomas C.; Wood, Douglas E.; and Kooy, Wayne J., 4,400,105, Cl. 400-616.100.

Process Shizai Co., Ltd.: *See*—
Kashiwagi, Takashi; and Inoue, Nobuyuki, 4,400,439, Cl. 428-478.200.

Procter & Gamble Company, The: *See*—
Benedict, James J., 4,399,817, Cl. 406-20.000.
Bush, Rodney D., 4,400,531, Cl. 560-201.000.
Dhanani, Shafiq; MacDonald, Ronald; Clunie, James S.; and Brooks, Maxim C., 4,400,288, Cl. 252-135.000.
Lance, William A.; and Abbott, Alfred H., 4,399,905, Cl. 198-422.000.
Riemersma, Coenraad E., 4,400,227, Cl. 156-73.100.

Proektny I Konstruktorsky Institut Splavov I Obrabotki Tsvetnyky Metallov "Giprotsvetmetobrabotka": *See*—
Shevakin, Jury F.; Seidaliev, Fikrat; S.; Tjushevsky, Vladimir M.; Krasovsky, Jury V.; Glebova, Erika D.; and Chivikin, Valery K., 4,400,605, Cl. 219-61.000.

Progress-Elektrogerate Mauz & Pfeiffer GmbH & Co.: *See*—
Kullik, Gunter R. J.; Durr, Werner; and Maier, Robert, 4,399,585, Cl. 15-319.000.

Protos, Bill K. Separator. 4,400,274, Cl. 210-302.000.

Prusak, John J., to RCA Corporation. Matrixing process for the manufacture of molded records. 4,400,245, Cl. 204-5.000.

PUMA-Sportschuhfabriken Rudolf Dassler KG: *See*—
Dassler, Armin A., 4,399,621, Cl. 36-32.00R.

Purps, Klaus: *See*—
Wahl, Klaus; and Purps, Klaus, 4,400,279, Cl. 210-679.000.

Purtec Systems, Inc.: *See*—
Shafer, Ronald E., 4,400,361, Cl. 423-226.000.

Pylat, John A., Jr. Automatic adjusting deceleration control for a hydrostatically powered device. 4,399,653, Cl. 60-327.000.

Pyle, Clayton C.; and Wigelsworth, Bobby R. Machine for cleaning grating over barn manure trough. 4,399,577, Cl. 15-49.00C.

Pytlewski, Louis L.; Krevitz, Kenneth; and Smith, Arthur B., to Franklin Institute, The. Method for decomposition of halogenated organic compounds. 4,400,552, Cl. 568-715.000.

Quackenbush, Carr L. W.: *See*—
Moschetti, Anthony P.; Smith, J. Thomas; Quackenbush, Carr L. W.; Lingertat, Helmut; and Nehring, Vincent W., 4,400,427, Cl. 428-332.000.

Questor Corporation: *See*—
Molitor, Robert P., 4,399,992, Cl. 273-73.00F.

Rabiner, Lawrence R.: *See*—
Myers, Cory S.; Pirz, Frank C.; and Rabiner, Lawrence R., 4,400,788, Cl. 364-513.000.
Pirz, Frank C.; Rabiner, Lawrence R.; and Wilpon, Jay G., 4,400,828, Cl. 382-30.000.

Radman, Anton J.: *See*—
Bauck, Randall C.; Kleczkowski, S. Peter; and Radman, Anton J., 4,400,748, Cl. 360-99.000.

Ragas, Frank J.: *See*—
Minnis, Ralph L.; Ragas, Frank J.; and Beauchamp, Gerson E., 4,400,441, Cl. 428-514.000.

Rahilly, W. Patrick, to United States of America, Air Force. Fabrication of gallium arsenide-germanium heteroface junction device. 4,400,221, Cl. 148-1.500.

Rahm, Charles L.: *See*—
Wong, Raphael W. H.; Ryason, Robert R.; and Rahm, Charles L., 4,400,694, Cl. 340-505.000.

Raidel, John E. Stabilized axle seat for cantilever mount. 4,400,009, Cl. 280-687.000.

Raineri, Giuseppe, to Pietro Laverda S.p.A. Combine harvester with an axial-flow threshing and separating unit. 4,399,825, Cl. 130-27.00S.

Rainey, David K.; and Fanthorpe, Michael M., to Fisons Limited. Synthesis of substituted phenols. 4,400,542, Cl. 568-315.000.

Raizon, Bernard: *See*—
Kaplan, Jean-Pierre; and Raizon, Bernard, 4,400,536, Cl. 564-269.000.

Rakoczy, Bohdan: *See*—
Fickes, Michael G.; and Rakoczy, Bohdan, 4,400,460, Cl. 430-306.000.

Rammelt, Peter-Paul; and Siegemund, Gunter, to Hoechst Aktiengesellschaft. Process for the preparation of hexafluoroacetone and direct use of the solution obtained by the process. 4,400,546, Cl. 568-386.000.

Ramsay, Samuel E.: *See*—
Rothschild, Stanley; and Ramsay, Samuel E., 4,399,732, Cl. 84-454.000.

Ramshaw, Colin; and Mallinson, Roger H., to Imperial Chemical Industries PLC. Mass transfer apparatus and process. 4,400,275, Cl. 210-321.100.

Rangachar, Hemmige V.; and Powell, Kenneth D., to RCA Corporation. System and method for controlling an etch line. 4,400,233, Cl. 156-626.000.

Ransome Hoffmann Pollard Limited: *See*—
Lacey, Stephen J.; Wardle, Frank P.; Walford, Thomas L. H.; Knight, Samuel H.; Kent, Anthony J.; and Sharman, Kenneth E., 4,400,098, Cl. 384-99.000.

Rao, S. Chandrasekhara: *See*—
Barron, Benjamin; and Rao, S. Chandrasekhara, 4,400,659, Cl. 322-32.000.

Ratcliff, Frank C.; and Galle, Edward M., to Hughes Tool Company. Nozzle retaining ring with crushed O-ring. 4,400,024, Cl. 285-356.000.

Ratcliffe, Ronald W.: *See*—
Christensen, Burton G.; Ratcliffe, Ronald W.; and Salzmann, Thomas N., 4,400,323, Cl. 260-239.00A.

Rathjen, Claus; and Ullrich, Martin, to Bayer Aktiengesellschaft. Process and an apparatus for the crystallization of melts with a simultaneous crushing operation. 4,400,175, Cl. 23-295.00R.

Rattner, Manfred: *See*—
Kuhnke, Hermann; and Rattner, Manfred, 4,400,822, Cl. 378-103.000.

Raue, Roderich: *See*—
Linhart, Karl; Gleinig, Harald; Raue, Roderich; and Kuhlthau, Hans-Peter, 4,400,321, Cl. 260-186.000.

Ray-Jens Corporation: *See*—
Heilskov, Jens A., 4,399,891, Cl. 182-150.000.

Ray, Ranjan; and Panchanathan, Viswanathan, to Marko Materials, Inc. Cobalt-chromium alloys which contain carbon and have been processed by rapid solidification process and method. 4,400,212, Cl. 75-251.000.

Raychem Corporation: *See*—
Sopory, Umesh K., 4,400,614, Cl. 219-528.000.

Raymark Industries, Inc.: *See*—
Santoso, Muljadi; and DiPino, Michael A., 4,400,434, Cl. 428-421.000.

RCA Corporation: *See*—
Avery, Leslie R., 4,400,711, Cl. 357-43.000.
Chen, Hsing-Yao, 4,400,649, Cl. 313-414.000.
Hale, John R., 4,400,644, Cl. 313-256.000.
Hinn, Werner, 4,400,720, Cl. 358-25.000.
Manson, Ernest T.; and Taylor, Byron K., 4,400,806, Cl. 369-170.000.
Mazgy, James D., 4,400,635, Cl. 307-445.000.
Powers, Kerns H., 4,400,719, Cl. 358-21.00R.

Prusak, John J., 4,400,245, Cl. 204-5.000.
Rangachar, Hemmige V.; and Powell, Kenneth D., 4,400,233, Cl. 156-626.000.
Taylor, Gordon C., 4,400,257, Cl. 204-192.00E.
Yost, Thomas D., 4,400,733, Cl. 358-155.000.

Realist, Inc.: *See*—
Hirsch, Stephen P., 4,400,068, Cl. 353-27.00R.

Ream, Ronald L.: *See*—
Muhler, Joseph C.; Kleber, Carl J.; Ream, Ronald L.; and Moore, David M., 4,400,372, Cl. 424-48.000.

Reed, Robert E., to Giddings & Lewis, Inc. Power grip tool exchange arm for machining center. 4,399,603, Cl. 29-568.000.

Reedy, James D.: *See*—
Baskent, Feyyaz O.; and Reedy, James D., 4,400,327, Cl. 260-429.00R.

Rehnberg, Ove A.; and Sundgren, Anders J., to Unikat AB. Method and a device for optimizing purification of diesel exhaust gases. 4,400,352, Cl. 422-4.000.

Reichhold Chemicals, Incorporated: *See*—
Wetzel, William H.; Pan, Hsi-Lung; Goodwin, Robert J.; and Wilkinson, John E., 4,400,556, Cl. 568-776.000.

Reichmanis, Elsa: *See*—
Chandross, Edwin A.; Reichmanis, Elsa; and Wilkins, Cletus W., Jr., 4,400,461, Cl. 430-311.000.

Reinehr, Ulrich; Herbertz, Toni; Jungverdorben, Hermann J.; and Dross, Joachim, to Bayer Aktiengesellschaft. Process for producing very fine denier synthetic fibers. 4,400,339, Cl. 264-206.000.

Reinhardt, Bruce A.; and Arnold, Fred E., to United States of America, Air Force. Oxy and thioaryl-phenylated aromatic biscyclopentadienones. 4,400,540, Cl. 568-31.000.

Reiter, Norbert: *See*—
Buchmann, Kurt; Eigen, Heinrich; and Reiter, Norbert, 4,400,116, Cl. 407-3.000.

Reliance Electric Company: *See*—
Hussey, Sam W., 4,400,625, Cl. 307-66.000.

REPA Feinstanzwerk GmbH: *See*—
Fohl, Artur, 4,399,655, Cl. 60-637.000.
Stutz, Michael; and Mitzkus, Jurgen, 4,400,010, Cl. 280-732.000.

Reph, Clinton A.: *See*—
Murphy, Paul D.; and Reph, Clinton A., 4,399,645, Cl. 52-743.000.

Reynolds, Blake: *See*—
Marion, Charles P.; Brent, Albert; Richter, George N.; Crouch, William B.; Child, Edward T.; and Reynolds, Blake, 4,400,179, Cl. 48-86.00R.
Marion, Charles P.; Crouch, William B.; Brent, Albert; Richter, George N.; Child, Edward T.; and Reynolds, Blake, 4,400,180, Cl. 48-197.00R.

Reynolds, Kenneth R.: *See*—
Penn, William B.; and Reynolds, Kenneth R., 4,399,949, Cl. 242-1.000.

Rheem Textile Systems, Inc.: *See*—
Ward, David B., 4,399,624, Cl. 38-27.000.

Richardson, Edwin A.; and Fair, Walter B., Jr., to Shell Oil Company. Unplugging brine-submerged perforations. 4,399,868, Cl. 166-300.000.

Richardson Graphics Company: *See*—
Dixit, Sunit S.; and Stansky, William V., Jr., 4,400,481, Cl. 524-55.000.

Richter Gedeon Vegyeszeti Gyar Rt.: *See*—
Szantay, Csaba; Szabo, Lajos; Kalaus, Gyorgy; Dancsi, Lajos; Keve, Tibor; Drexler, Ferenc; and Mihalyfi, Krisztina, 4,400,514, Cl. 546-51.000.

Richter, George N.: *See*—
Marion, Charles P.; Brent, Albert; Richter, George N.; Crouch, William B.; Child, Edward T.; and Reynolds, Blake, 4,400,179, Cl. 48-86.00R.
Marion, Charles P.; Crouch, William B.; Brent, Albert; Richter, George N.; Child, Edward T.; and Reynolds, Blake, 4,400,180, Cl. 48-197.00R.

Richter, Roland; Muller, Hanns P.; Wagner, Kuno; Helm, Rudolf; and Zander, Jurgen, to Bayer Aktiengesellschaft. Process for the preparation of a mixture of low-molecular weight polyhoric alcohols. 4,400,560, Cl. 568-863.000.

Richter, Simon J.; and Sanscharowskiy, Michael, to Coca-Cola Company, The. Reject system for in-line pressure testing system. 4,399,916, Cl. 209-559.000.

Richter, Wolfgang; Kummer, Rudolf; and Schwirten, Kurt, to BASF Aktiengesellschaft. Hydroformylation of olefinically unsaturated compounds. 4,400,549, Cl. 568-454.000.

Rickmann, Bernard C., to Square D Company. Flexible cable mechanical interlock for electric control devices. 4,400,599, Cl. 200-50.00C.

Ricoh Company Ltd.: *See*—
Hashimoto, Mitsuru; Sakai, Kiyoshi; Ohta, Katsunari; and Kojima, Akio, 4,400,455, Cl. 430-59.000.
Horike, Masanori, 4,400,705, Cl. 346-75.000.
Matsuda, Tsutomu; and Kusakata, Shigeru, 4,400,456, Cl. 430-138.000.
Mayer, Edward F., 4,400,078, Cl. 355-3.0DD.
Yamashita, Tadashi; and Okamoto, Toyoo, 4,400,081, Cl. 355-15.000.

Riebel, Hans-Jochem: *See*—
Jautelat, Manfred; Arlt, Dieter; Lantzsch, Reinhard; Fuchs, Rainer; Riebel, Hans-Jochem; Schroder, Rolf; and Harnisch, Horst, 4,400,523, Cl. 549-320.000.

Riemersma, Coenraad E., to Procter & Gamble Company, The. Dynamic ultrasonic laminating apparatus having post-bonding pressure roll, and concomitant method. 4,400,227, Cl. 156-73.100.

Riessberger, Klaus: *See*—
Theurer, Josef; and Riessberger, Klaus, 4,399,881, Cl. 177-137.000.

Rieter Machine Works Ltd.: *See*—
Hefti, Walter, 4,399,589, Cl. 19-0.600.
Wildbolz, Rudolf, 4,399,590, Cl. 19-145.500.

Rijkens, Berend A., to Instituut voor Bewaring en Verwerking van Landbouwprodukten. Method for the anaerobic digestion of solid organic waste. 4,400,195, Cl. 71-10.000.

Riker Laboratories, Inc.: *See*—
Stern, Richard M., 4,400,386, Cl. 424-258.000.

Riley, Leon H. Method of making layered semiconductor laser. 4,400,256, Cl. 204-192.00S.

Rinehart, Jay K., to PPG Industries, Inc. N-(Optionally substituted 1,3-dioxolan- or dioxan-2-ylmethyl)-N-alkyl, alkenyl, or alkynyl-2,2-dichloroacetamides. 4,400,197, Cl. 71-88.000.

Rines, Robert H.: *See*—
Knowles, Albert H.; and Rines, Robert H., 4,399,770, Cl. 119-3.000.

Rinne, Helmut: *See*—
Hans-Jurgen, Busack; Kaross, Klaus; and Rinne, Helmut, 4,400,258, Cl. 204-415.000.

Ritchie, Andrew M. F.: *See*—
Breward, Michael J.; and Ritchie, Andrew M. F., 4,399,899, Cl. 192-98.000.

Rittenbach, Otto E.; and Olesch, Reinhard G., to United States of America, Army. Electronic intruder detection system. 4,400,695, Cl. 340-566.000.

Rittenbach, Otto E., to United States of America, Army. Doppler frequency analysis of radar signals. 4,400,700, Cl. 343-55.00A.

Ritter, Harry W.; and Edwards, Michael L., to Merrell Dow Pharmaceuticals Inc. Antiviral 1-aryl-5-amino-1-penten-3-ones. 4,400,380, Cl. 424-248.500.

Robach, Michael C., to Monsanto Company. Preservation with acyloxy-5-hexenoic and acyloxy-4-hexenoic acids. 4,400,403, Cl. 426-532.000.

Robare, Arthur P., to Cascade Steel Rolling Mills, Inc. Controlled stop circuit for furnaces. 4,400,816, Cl. 373-104.000.

Robbins, Thomas R.: *See*—
Wachter, William J.; and Robbins, Thomas R., 4,400,344, Cl. 376-272.000.

Rober, Hans-Gerd: *See*—
Kiefer, Hans; and Rober, Hans-Gerd, 4,400,621, Cl. 250-385.000.

Roberson, Keith; and Filter, Harold E., to Dow Chemical Company, The. Process for waste encapsulation. 4,400,313, Cl. 252-628.000.

Robert Bosch GmbH: *See*—
Dworak, Wilhelm; Muller, Karl-Heinz; Mayer, Siegfried; Talmon, Wolfgang; and Grabow, Kurt, 4,400,146, Cl. 418-131.000.
Krauss, Rudolf; and Sauer, Rudolf, 4,399,944, Cl. 239-585.000.
Stahl, Roland; and Wiedenmann, Hans-Martin, 4,400,260, Cl. 204-426.000.

Robert, Michel, to Societe Europeenne De Propulsion. Surface tension storage tank. 4,399,831, Cl. 137-154.000.

Roberts, Michael A.: *See*—
Copperthwaite, Martin; and Roberts, Michael A., 4,400,474, Cl. 501-119.000.

Robertshaw Controls Company: *See*—
Buckshaw, Thomas M., 4,399,606, Cl. 29-602.00R.

Robinson, Delmar W., to UOP Inc. Hydrocarbon isomerization process. 4,400,571, Cl. 585-480.000.

Robison, Thomas W.: *See*—
Butler, James R.; Forward, Cleve H.; and Robison, Thomas W., 4,400,570, Cl. 585-467.000.

Rockwell International Corporation: *See*—
Brown, James H.; and Grande, Johannes, 4,400,811, Cl. 371-69.000.
Jones, Addison B., 4,400,407, Cl. 427-8.000.
Lacy, Larry D., 4,400,626, Cl. 307-66.000.
Lewis, Jack R.; and Walter, Robert J., 4,400,442, Cl. 428-544.000.
Nadler, Harry, 4,400,805, Cl. 367-140.000.
Stock, William H.; and Holland, Bernard C., Jr., 4,399,968, Cl. 244-137.00R.
Taylor, Michael P.; and Oliphant, Jean R., 4,400,587, Cl. 179-27.00D.

Rod, Robert L.: *See*—
Kroger, Ferdinand A.; Rod, Robert L.; and Panicker, M. P. Ramachandra, 4,400,244, Cl. 204-2.100.

Rodowsky, Stanley, Jr.; and Nicholson, R. Kent, to Black & Decker Inc. Switching system for an air-driven tool. 4,399,638, Cl. 51-170.00R.

Rodun Development Corporation: *See*—
Dunegan, Ronald G., 4,400,123, Cl. 411-373.000.

Roessler, Berward: *See*—
Klar, Heinrich; and Roessler, Berward, 4,400,637, Cl. 307-497.000.

Rogers Corporation: *See*—
Ahumada, Jorge S., 4,400,595, Cl. 200-5.00A.

Rogers, Horace B., Jr., to Akzona, Incorporated. Method and apparatus for production of textured yarn. 4,399,597, Cl. 28-250.000.

Rohm and Haas Company: *See*—
Emmons, William D.; and Lavelle, Joseph A., 4,400,413, Cl. 427-136.000.
Kelley, Everett J.; and Ilenda, Casmir S., 4,400,500, Cl. 528-345.000.
Smolanoff, Joel, 4,400,512, Cl. 546-16.000.

Rohr, Otto: *See*—
Pissiotas, Georg; and Rohr, Otto, 4,400,205, Cl. 71-105.000.

Romblom, Edward R.; and Sundeen, Arthur R., to General Motors Corporation. Engine control suitable for exhaust gas recirculation control. 4,399,799, Cl. 123-571.000.

Romeo, Albert J.: *See*—
Beisty, James M.; Miller, Robert J.; and Romeo, Albert J., 4,400,083, Cl. 355-16.000.

Romer, Michael; Krause, Joachim; and Pohl, Ludwig, to Merck Patent Gesellschaft mit beschrankter Haftung. Liquid crystalline cyclohexylphenyl derivatives. 4,400,293, Cl. 252-299.630.

Rones, Josef: *See*—
Geldner, Joachim; Rones, Josef; and Danzel, Horst, 4,400,289, Cl. 252-142.000.

Rosch, Gunter: *See*—
Martini, Thomas; and Rosch, Gunter, 4,400,294, Cl. 252-301.240.

Rosen, Alfred H.: *See*—
Lustig, Leopold P.; and Rosen, Alfred H., 4,400,160, Cl. 433-224.000.

Rosenthal, Heinrich; Schinkel, Ingo; Eger, Gunter; and Bair, Wolfgang, to Wolff Walsrode Aktiengesellschaft. Sealable multilayer films. 4,400,428, Cl. 428-349.000.

Ross, Donald R., Sr., to U-S Safety Trolley Corporation. Electric power transmission system. 4,400,592, Cl. 191-34.000.

Ross, Oakley G.: *See*—
Wedertz, Larry D.; Niemeier, Byron M.; and Ross, Oakley G., 4,399,962, Cl. 244-3.230.

Rosseels, Gilbert; and Nokin, Pierre, to S. A. Labaz-Sanofi N.V. Indolizine derivatives and uses in therapeutics. 4,400,387, Cl. 424-263.000.

Rossi, Alessandro: *See*—
Zetler, Gerhard; Rossi, Alessandro; and De Paolis, Chiara, 4,400,377, Cl. 424-177.000.

Rossow, Robert W. Collapsible storage cabinet. 4,400,043, Cl. 312-111.000.

Rothschild, Stanley; and Ramsay, Samuel E. Pitch identification device. 4,399,732, Cl. 84-454.000.

Rouaud, Christian: *See*—
Abbes, Claude; Rouaud, Christian; Forges, Robert; and de Villepoix, Raymond, 4,400,018, Cl. 285-31.000.

Roussel Uclaf: *See*—
Herve, Jean J.; and Smolikowski, Serge, 4,400,392, Cl. 424-304.000.

Rueger, William J., to International Business Machines Corp. Pantocam web threading apparatus. 4,399,936, Cl. 226-92.000.

Ruhrchemie Aktiengesellschaft: *See*—
Koschnitzke, Walter; and Beuth, Paul, 4,400,097, Cl. 374-121.000.

Rumpel, Manfred, to Ford Motor Company. Independent rear wheel suspension with a spring seat fixed to a control arm. 4,400,008, Cl. 280-666.000.

Rundo, John R., to Tremco, Incorporated. Method for making sealant. 4,400,338, Cl. 264-171.000.

Ruppert, Wolfgang: *See*—
Hofmann, Hanns; Emig, Gerd; and Ruppert, Wolfgang, 4,400,568, Cl. 585-443.000.

Rustemis, Constantine F. Planetarium. 4,400,162, Cl. 434-291.000.

Ruud, Jan T. Powder sprayer. 4,399,945, Cl. 239-697.000.

Ryan, John W., to Agrowplow Pty Limited. Agricultural tool shank and spring release. 4,399,874, Cl. 172-269.000.

Ryason, Robert R.: *See*—
Wong, Raphael W. H.; Ryason, Robert R.; and Rahm, Charles L., 4,400,694, Cl. 340-505.000.

Rydstad, Hans. Method of sealing a fluidized bed and device for carrying out the method. 4,399,618, Cl. 34-10.000.

Rydval, Peter, to Siemens Aktiengesellschaft. Integrated digital semiconductor circuit. 4,400,802, Cl. 365-226.000.

Ryu, Nobuyuki, to Toyota Jidosha Kogyo Kabushiki Kaisha. Retractors embedded in side frame members of cars. 4,400,015, Cl. 280-807.000.

Ryu, Yumi P.: *See*—
Singerman, Gary M.; Ryu, Yumi P.; and Anglin, James R., 4,400,282, Cl. 252-32.70E.

Ryuzo, Kimoto: *See*—
Takeuchi, Tatsuro; Masaki, Sokukawa; and Ryuzo, Kimoto, 4,400,305, Cl. 252-430.000.

S.A.G.A. Societa' Applicazioni Gomma Antivibranti S.p.A.: *See*—
Cucelli, Andrea; Brizzolesi, Gustavo; and Bossi, Emilio, 4,399,987, Cl. 267-140.100.

S. A. Labaz-Sanofi N.V.: *See*—
Rosseels, Gilbert; and Nokin, Pierre, 4,400,387, Cl. 424-263.000.

SACE S.p.A. Costruzioni Elettromeccaniche: *See*—
Mostosi, Angelo, 4,400,670, Cl. 335-6.000.

Sachs, Richard L. Disposable inker cartridge and holder therefor. 4,400,708, Cl. 346-140.00R.

Sacks, Norman M., to Burndy Corporation. Electrical connector with resilient pulling eye. 4,400,048, Cl. 339-46.000.

Safeway Stores, Incorporated: *See*—
Nielsen, Dean M., 4,399,658, Cl. 62-52.000.

Sahara, Masayoshi: *See*—
Izumi, Shuji; Sahara, Masayoshi; and Nakai, Masaaki, 4,400,691, Cl. 340-347.0AD.

St. Georgiev, Vassil: *See*—
Brown, Richard E.; St. Georgiev, Vassil; Kropp, Philip; and Loev, Bernard, 4,400,382, Cl. 424-250.000.

St. Pierre, Alfred J.; Darnstaedt, Dann; and Blake, Laurence S., to Compugraphic Corporation. Phototypesetter font disk. 4,400,069, Cl. 354-11.000.

Saito, Takashi; Hirano, Toshio; and Kumaki, Takashi, to Victor Company of Japan, Ltd. Rotary recording medium reproducing apparatus. 4,400,808, Cl. 369-262.000.

Sakae Tsushin Kogyo Co. Ltd.: *See*—
Shimoda, Eitaro; and Yamashita, Kiyoshi, 4,400,687, Cl. 338-184.000.

Sakai, Kiyoshi: *See*—
Hashimoto, Mitsuru; Sakai, Kiyoshi; Ohta, Katsunari; and Kojima, Akio, 4,400,455, Cl. 430-59.000.

Sakamoto, Eiichi: *See*—
Ono, Kouzi; Kawasaki, Mikio; Natori, Mariko; and Sakamoto, Eiichi, 4,400,462, Cl. 430-415.000.

Sakata, Hiromi: *See*—
Kozuka, Nobuhiko; Yamagata, Ryutaro; Koyama, Shigeo; Sakata, Hiromi; and Kano, Atsushi, 4,400,077, Cl. 355-3.0DR.

Sakuramoto, Akira: *See*—
Hanamura, Yoshimi; Yuyama, Masahiro; and Sakuramoto, Akira, 4,400,236, Cl. 159-2.00E.

Sakutori, Eric M. Refrigerator cold air retaining device. 4,399,666, Cl. 62-265.000.

Sala, Jacques: *See*—
Deweerdt, Julien; Sala, Jacques; and Souyri, Denis, 4,400,329, Cl. 260-455.00B.

Salamon, Hugo: *See*—
Barsi, Karoly; Salamon, Hugo; Solymos, Andras; Takacs, Jozsef; and Toth, Istvan, 4,400,035, Cl. 299-11.000.

Salinas, Rufus C. Animal feeder. 4,399,772, Cl. 119-51.500.

Salzmann, Thomas N.: *See*—
Christensen, Burton G.; Ratcliffe, Ronald W.; and Salzmann, Thomas N., 4,400,323, Cl. 260-239.00A.

Sami, Shunsuke; Sugie, Akihiko; Ono, Keiichi; Kawakami, Hajime; Kojima, Atsuyuki; and Katsube, Junki, to Sumitomo Chemical Company, Limited. Novel bicyclooctane compounds. 4,400,393, Cl. 424-305.000.

Samuels, Peter B.; Wood, Ernest, deceased; and by Lee, George S. Skin clip and applier. 4,399,810, Cl. 128-337.000.

Samurin, Norman A.: *See*—
Geary, Carl H., Jr.; and Samurin, Norman A., 4,399,651, Cl. 60-39.020.

Sancor Pump Co.: *See*—
Seyffert, Kenneth W., 4,400,136, Cl. 415-140.000.

Sanders, Robert N., to Ethyl Corporation. Method of making zeolites. 4,400,366, Cl. 423-329.000.

Sanderson, Arnold R., to National Research Development Corporation. Immunological preparations. 4,400,376, Cl. 424-88.000.

Sandorff, Paul E., to Lockheed Corporation. Staggered coil and nose-torquer electromagnetic pulse deicing systems. 4,399,967, Cl. 244-134.00R.

Sandoz Ltd.: *See*—
Milzner, Karlheinz, 4,400,201, Cl. 71-92.000.

Sandvik Aktiebolag: *See*—
Karlsson, Harry L.; and Norlander, Lars G., 4,399,878, Cl. 175-227.000.

Sangamo Weston, Inc.: *See*—
Belkin, Martin, 4,400,667, Cl. 331-1.00A.

Sankyo Company, Limited: *See*—
Terada, Atsusuke; and Misaka, Eiichi, 4,400,534, Cl. 562-468.000.

Sanofi, S.A.: *See*—
Amselem, Armand; Eloy, Fernand; and Maffrand, Jean-Pierre, 4,400,384, Cl. 424-256.000.

Sanscharowskiy, Michael: *See*—
Richter, Simon J.; and Sanscharowskiy, Michael, 4,399,916, Cl. 209-559.000.

Santa Barbara Research Center: *See*—
Clark, L. Dale; and Archambeault, William J., 4,400,812, Cl. 372-29.000.

Santos, Luiz D. D.: *See*—
De Souza Dias, Edson; Santos, Luiz D. D.; Teixeira, Joao C.; Amorin, Osvaldo; and Lamprecht, Antonio R. D. A., 4,399,846, Cl. 141-192.000.

Santoso, Muljadi; and DiPino, Michael A., to Raymark Industries, Inc. Fluoroelastomer composite friction material. 4,400,434, Cl. 428-421.000.

Santrade Ltd.: *See*—
Liljekvist, Bernt S.; and Persson, Anders E., 4,399,879, Cl. 175-372.000.

Sardo, Vincent, Jr. Socket wrench including quick-release adaptor. 4,399,722, Cl. 81-60.000.

Sato, Masamichi; Hasegawa, Eiichi; and Shimanuki, Koji, to Fuji Photo Film Co., Ltd. Process of producing color solid image pickup element base plates. 4,400,454, Cl. 430-7.000.

Sato, Shigeo: *See*—
Akiyama, Kazuhiko; Yoshino, Takeshi; Shiina, Michihiro; Sato, Shigeo; Nishizawa, Tetsuo; Yoshida, Toshio; and Kobayashi, Nobuo, 4,400,074, Cl. 354-173.000.

Sauer, Rudolf: *See*—
Krauss, Rudolf; and Sauer, Rudolf, 4,399,944, Cl. 239-585.000.

Savin Corporation: *See*—
Landa, Benzion, 4,400,079, Cl. 355-10.000.
Landa, Benzion, 4,400,739, Cl. 358-293.000.

Saxby: *See*—
Penifaure, Jacques P., 4,399,587, Cl. 16-35.00D.

Scaglione, Paul J. Box spout. 4,399,929, Cl. 222-81.000.

Scanlon, J. Kevin; and Greenberg, Charles B., to PPG Industries, Inc. Thermochromic vanadium oxide coated glass. 4,400,412, Cl. 427-87.000.

Scaramuzza, Joseph: *See*—
Cohen, Barry J.; Scaramuzza, Joseph; and Tock, Graham, 4,399,943, Cl. 239-125.000.

Schaaf, Wayne J.; and Boswell, Bennie J., to Chromalloy American Corporation. Automatic support for folding wing frame implement. 4,399,875, Cl. 172-311.000.

Schack, Peter: *See—*
Freller, Helmut; and Schack, Peter, 4,400,254, Cl. 204-192.00P.

Schadlich, Renate: *See—*
Moraw, Roland; and Schadlich, Renate, 4,400,057, Cl. 350-162.200.

Schaefer, Martin A., to Sperry Corporation. Wide bandwidth high voltage regulator and modulator. 4,400,660, Cl. 323-270.000.

Schafer, Herbert. Elastic tail skid for gliders and light air planes. 4,399,963, Cl. 244-104.00R.

Schaltbau Gesellschaft mbH: *See—*
Kratzmair, Ernst, 4,400,629, Cl. 307-127.000.

Schaper, Peter; and Laing, Oliver. Heat storage materials suitable in particular for indoor air cooling. 4,400,286, Cl. 252-70.000.

Schaub & Cie AG: *See—*
Schaub, Werner, 4,399,952, Cl. 242-47.050.

Schaub, Werner, to Schaub & Cie AG. Thread delivery apparatus. 4,399,952, Cl. 242-47.050.

Scheinpflug, Hans: *See—*
Timmler, Helmut; Buchel, Karl H.; Brandes, Wilhelm; Frohberger, Paul-Ernst; and Scheinpflug, Hans, 4,400,388, Cl. 424-269.000.

Schenck, Hans-Uwe: *See—*
Blum, Rainer; Lehner, August; and Schenck, Hans-Uwe, 4,400,497, Cl. 528-45.000.

Schenck, Stephen R.: *See—*
Closson, Thomas A.; Oxford, David B.; Schenck, Stephen R.; and Seitchik, Jerold A., 4,400,796, Cl. 365-8.000.

Scher, Herbert I.; and Ungar, Israel S., to Nevamar Corporation. Abrasion-resistant laminate. 4,400,423, Cl. 428-204.000.

Schiel, Christian; and Wolf, Robert, to J. M. Voith GmbH. Press roll with adjustable sag capability. 4,399,747, Cl. 100-162.00B.

Schiemann, Wolfram. Brace for plastic canisters. 4,399,850, Cl. 150-0.500.

Schiess-Defries Hebezeug-und Transporteinrichtungen GmbH: *See—*
Lietzke, Heinz; and Mayr, Heribert K., 4,400,111, Cl. 405-196.000.

Schiffner, Gerhard; and Siemens Aktiengesellschaft. Ring interferometer with an arrangement for reducing the influence of undesired light. 4,400,088, Cl. 356-350.000.

Schilling, Curtis L., Jr.: *See—*
Kanner, Bernard; Schilling, Curtis L., Jr.; and Hopper, Steven P., 4,400,526, Cl. 556-420.000.

Schinkel, Ingo: *See—*
Rosenthal, Heinrich; Schinkel, Ingo; Eger, Gunter; and Bair, Wolfgang, 4,400,428, Cl. 428-349.000.

Schloemer, Gerhard; and Steinweg, Klaus, to Gerhardi & Cie. Firma. Synthetic resin glass insulating pane. 4,399,641, Cl. 52-309.100.

Schmid, Richard G.: *See—*
Fanizza, Michael A.; and Schmid, Richard G., 4,400,723, Cl. 358-60.000.

Schneider, Werner, to Dango & Dienenthal Maschinenbau GmbH. Method of and device for the removal of burden samples. 4,399,710, Cl. 73-863.830.

Schneiders, Leonardus H. J. M.: *See—*
Arkenbout, Gerardus J.; van Kuijk, Albert; van der Meer, Johannes; and Schneiders, Leonardus H. J. M., 4,400,189, Cl. 62-538.000.

Schnitzius, Klaus: *See—*
Freitag, Herbert; and Schnitzius, Klaus, 4,400,600, Cl. 200-52.00R.

Schott Glaswerke: *See—*
Mennemann, Karl; Gliemeroth, Georg; and Geiler, Volkmar, 4,400,473, Cl. 501-77.000.

Schott, Robert E.: *See—*
Ballendux, Gerardus M.; and Schott, Robert E., 4,399,900, Cl. 192-106.00F.

Schrage, Klaus: *See—*
aus der Funten, Helmut; and Schrage, Klaus, 4,400,533, Cl. 562-443.000.

Schroder, Rolf: *See—*
Jautelat, Manfred; Arlt, Dieter; Lantzsch, Reinhard; Fuchs, Rainer; Riebel, Hans-Jochem; Schroder, Rolf; and Harnisch, Horst, 4,400,523, Cl. 549-320.000.

Schubert, Malvin L., to General Motors Corporation. Vacuum suspended brake booster control valve. 4,399,736, Cl. 91-469.000.

Schuck, David B., to NCR Corporation. Connector for interconnecting circuit boards. 4,400,049, Cl. 339-176.0MP.

Schucker, Robert C.: *See—*
Bearden, Roby, Jr.; and Schucker, Robert C., 4,400,262, Cl. 208-8.00R.

Schuenemann, Claus, to International Business Machines Corp. Method and arrangement for fast access to CCD-stores. 4,400,793, Cl. 364-900.000.

Schuetz, Adolph A.: *See—*
Prestridge, Floyd L.; Schuetz, Adolph A.; and Wheeler, Harry L., 4,400,253, Cl. 204-186.000.

Schuler, Charles W. Tapping apparatus and method. 4,399,829, Cl. 137-15.000.

Schultz, Richard M.: *See—*
Douthart, Richard J.; Kleinschmidt, Walter J.; and Schultz, Richard M., 4,400,375, Cl. 424-85.000.

Schutt, William R., to Matcor, Inc. Deep anode assembly. 4,400,259, Cl. 204-196.000.

Schutten, Jan H.: *See—*
Wortel, Theodorus M.; and Schutten, Jan H., 4,400,567, Cl. 585-428.000.

Schwade, Hans; and Albers, Karl, to Bergemann GmbH. Soot blaster. 4,399,773, Cl. 122-390.000.

Schwartz, Robert C.; and Sparks, John E., to Horn & Gladden Lint Cleaner Company, Inc. Extractor-feeder. 4,399,591, Cl. 19-202.000.

Schweickardt, Karl, to Esquire, Inc. Spark arrestor. 4,400,754, Cl. 361-38.000.

Schwerdt, Paul: *See—*
Weiger, Gunter; Schwerdt, Paul; and Ziegenberg, Alfred, 4,399,705, Cl. 73-654.000.

Schwirten, Kurt: *See—*
Richter, Wolfgang; Kummer, Rudolf; and Schwirten, Kurt, 4,400,549, Cl. 568-454.000.

Scientific Pharmaceuticals, Inc.: *See—*
Orlowski, Jan A.; Butler, David V.; and Kidd, Patrick D., 4,400,159, Cl. 433-202.000.

Scott, Peter J. Measuring instrument. 4,399,612, Cl. 33-20.00R.

Scribner, Albert W. High speed dual slide stock feeder. 4,399,937, Cl. 226-162.000.

Sedgewick, Richard D. Zig-zag winding machine. 4,399,843, Cl. 140-92.200.

Seidaliev, Fikrat; S.: *See—*
Shevakin, Jury F.; Seidaliev, Fikrat; S.; Tjushevsky, Vladimir M.; Krasovsky, Jury V.; Glebova, Erika D.; and Chivikin, Valery K., 4,400,605, Cl. 219-61.000.

Seifert, Peter: *See—*
Haas, Peter; Muller, Heinz; Seifert, Peter; Wagner, Kuno; Findeisen, Kurt; and Konig, Klaus, 4,400,331, Cl. 260-932.000.

Seiko Koki Kabushiki Kaisha: *See—*
Ogihara, Musuo; Shinozaki, Nobuo; Ishikawa, Tadashi; and Seki, Yoichi, 4,400,091, Cl. 368-80.000.

Seitchik, Jerold A.: *See—*
Closson, Thomas A.; Oxford, David B.; Schenck, Stephen R.; and Seitchik, Jerold A., 4,400,796, Cl. 365-8.000.

Seki, Yoichi: *See—*
Ogihara, Musuo; Shinozaki, Nobuo; Ishikawa, Tadashi; and Seki, Yoichi, 4,400,091, Cl. 368-80.000.

Sekiguchi, Takuji, to Nippon Hoso Kyokai. Fixed rate delay circuit. 4,400,666, Cl. 328-130.100.

Sekimoto, Kunio; Yamamoto, Katsuhiko; Yamamitsu, Chojuro; and Kurashina, Kozo, to Matsushita Electric Industrial Company, Limited. Video tape recorder with inter-channel switching circuit for special modes of reproduction. 4,400,741, Cl. 358-312.000.

Seng, Stephen: *See—*
Dunn, Charles S.; and Seng, Stephen, 4,400,815, Cl. 373-92.000.

Sentinel Manufacturing Company, Incorporated: *See—*
Mills, J. T., 4,399,785, Cl. 123-198.0DB.

Serov, Nikolai F.: *See—*
Vishnevsky, Vladimir S.; Koval, Vitaly S.; Lavrinenko, Vyacheslav V.; Boichenko, Oleg L.; Kartashev, Igor A.; Golovyashin, Jury V.; Serov, Nikolai F.; Shinkarenko, Leonid I.; and Jurash, Oleg G., 4,400,641, Cl. 310-323.000.

Serras-Paulet, Edouard. Control keyboard for electric or electronic devices. 4,400,594, Cl. 200-5.00A.

Setzer, Herbert J.: *See—*
McVay, Donald R.; and Setzer, Herbert J., 4,400,356, Cl. 422-171.000.

Severson, Sylvester B., to Peterson, J. Charles; and Nelson, Roger. Corrugated air return bulkhead. 4,399,737, Cl. 98-6.000.

Seyffert, Kenneth W., to Sancor Pump Co. Centrifugal pump impeller attachment. 4,400,136, Cl. 415-140.000.

Shafer, Ronald E., to Purtec Systems, Inc. Method of removing H_2S from a gas stream utilizing boron-vanadium and iron complexes. 4,400,361, Cl. 423-226.000.

Shank, Charles V.: *See—*
Fork, Richard L.; Greene, Benjamin I.; and Shank, Charles V., 4,400,814, Cl. 372-94.000.

Shanshin Kogyo Kabushiki Kaisha: *See—*
Iwai, Tomio, 4,399,797, Cl. 123-552.000.

Shape Inc.: *See—*
Gelardi, Anthony L.; Gelardi, Paul J.; and MacLeod, Robert B., Jr., 4,399,913, Cl. 206-387.000.

Shapiro, Ira P., to Burroughs Corporation. Rotary switch simulator. 4,400,818, Cl. 377-54.000.

Shapoval, Vladimir I.: *See—*
Pastushenko, Jury I.; Spynu, Gleb A.; Nazarenko, Oleg K.; Lokshin, Viktor E.; and Shapoval, Vladimir I., 4,400,609, Cl. 219-121.0EV.

Sharkey, Arlis F. Ventilating structure for greenhouse. 4,399,738, Cl. 98-32.000.

Sharman, Kenneth E.: *See—*
Lacey, Stephen J.; Wardle, Frank P.; Walford, Thomas L. H.; Knight, Samuel H.; Kent, Anthony J.; and Sharman, Kenneth E., 4,400,098, Cl. 384-99.000.

Sharp, Gordon P.: *See—*
Curtiss, William P.; and Sharp, Gordon P., 4,400,655, Cl. 318-729.000.

Shaunfield, John E.: *See—*
Biard, James R.; Shaunfield, John E.; and Speer, Royce S., 4,400,054, Cl. 350-96.150.

Shaw, Michael J., to Allied Paper Incorporated. Electrostatic paper base and method of making the same. 4,400,440, Cl. 428-511.000.

Sheinberg, Haskell. Novel hard compositions and methods of preparation. 4,400,213, Cl. 75-238.000.

Shell Oil Company: *See—*
Ayers, Ray R., 4,399,601, Cl. 29-407.000.
den Otter, Gerrit J., 4,400,576, Cl. 585-739.000.

Diaz, Zaida, 4,400,368, Cl. 423-573.00R.
Gergen, William P.; and Halper, Walter M., 4,400,478, Cl. 523-514.000.
Goodall, Brian L.; van der Nat, Adrianus A.; and Sjardijn, Willem, 4,400,302, Cl. 252-429.00B.
Kwant, Pieter B.; and Newsome, John R., 4,400,264, Cl. 208-68.000.
Orr, Alexander F.; and Barker, Michael D., 4,400,198, Cl. 71-88.000.
Richardson, Edwin A.; and Fair, Walter B., Jr., 4,399,868, Cl. 166-300.000.

Shelley, Jack W. Device for starting internal combustion engines. 4,399,782, Cl. 123-179.0SE.

Shen, Roderick C., to Mobil Oil Corporation. Cascade catalytic dewaxing/hydrodewaxing process. 4,400,265, Cl. 208-97.000.

Sherman, Ira N.: *See*—
Boggi, John J.; Centrone, Gerald V.; Dolin, Aaron M.; and Sherman, Ira N., 4,400,825, Cl. 378-150.000.

Shevakin, Jury F.; Seidaliev, Fikrat; S.; Tjushevsky, Vladimir M.; Krasovsky, Jury V.; Glebova, Erika D.; and Chivikin, Valery K., to Gosudarstvenny Nauchnoissledovatelsky; and Proektny I Konstruktorsky Institut Splavov I Obrabotki Tsvetnyky Metallov "Giprotsvetmetobrabotka". Method of producing welded thin-wall straight-seamed tubes. 4,400,605, Cl. 219-61.000.

Shibata, Koichi: *See*—
Minato, Ichiro; Shibata, Koichi; and Fujinami, Kimiya, 4,400,525, Cl. 549-552.000.

Shibukawa, Kozo: *See*—
Nishikata, Goro; and Shibukawa, Kozo, 4,399,613, Cl. 33-143.00M.

Shida, Sankichi: *See*—
Ogawa, Yasuhiro; Shida, Sankichi; Honjo, Katsuhiko; and Todoroki, Tsunehiko, 4,400,214, Cl. 106-1.130.

Shidara, Tokihiko, to Tokyo Shibaura Denki Kabushiki Kaisha. X-Ray tube with single crystalline copper target member. 4,400,824, Cl. 378-141.000.

Shigeta, Yoshihiro: *See*—
Tosaka, Yoichi; Uchidoi, Masanori; Shigeta, Yoshihiro; Yoshikawa, Ryoichi; and Haraguchi, Shosuke, 4,400,073, Cl. 354-173.000.

Shiina, Michihiro: *See*—
Akiyama, Kazuhiko; Yoshino, Takeshi; Shiina, Michihiro; Sato, Shigeo; Nishizawa, Tetsuo; Yoshida, Toshio; and Kobayashi, Nobuo, 4,400,074, Cl. 354-173.000.

Shikata, Makoto, to Fuji Jukogyo Kabushiki Kaisha. System for controlling cooling water temperature for a water-cooled engine. 4,399,776, Cl. 123-41.080.

Shimada, Masatoshi: *See*—
Ishikawa, Masashi; Shimada, Masatoshi; Okamoto, Katsutomo; Sugita, Shigeyoshi; Goto, Masayuki; Koizumi, Yukuo; and Kaneda, Osamu, 4,400,782, Cl. 364-481.000.

Shimamune, Takayuki: *See*—
Asano, Hiroshi; Shimamune, Takayuki; Goto, Toshiki; Nitta, Hideo; and Hosonuma, Masashi, 4,400,408, Cl. 427-35.000.

Shimanuki, Koji: *See*—
Sato, Masamichi; Hasegawa, Eiichi; and Shimanuki, Koji, 4,400,454, Cl. 430-7.000.

Shimanuki, Yasushi: *See*—
Komori, Shinichi; Shimanuki, Yasushi; and Suzuki, Isamu, 4,400,351, Cl. 420-489.000.

Shimazaki, Takeshi: *See*—
Takahashi, Akio; Itoh, Yutaka; Shimazaki, Takeshi; Wajima, Motoyo; Morishita, Hirosada; Mizuno, Yutaka; Yokozawa, Shunya; and Tsukanishi, Kenji, 4,400,438, Cl. 428-458.000.

Shimizu, Kazuyuki: *See*—
Kaneda, Saburo; Matsumura, Naomi; Ikegami, Fujio; Shimizu, Kazuyuki; and Ikuta, Yukichi, 4,400,769, Cl. 364-200.000.

Shimizu, Keizo: *See*—
Furuichi, Tokinori; Ikoma, Junichi; Oguri, Masao; Miura, Yoshio; and Shimizu, Keizo, 4,400,807, Cl. 369-220.000.

Shimoda, Eitaro; and Yamashita, Kiyoshi, to Sakae Tsushin Kogyo Co. Ltd. Housing for use with a variable resistor. 4,400,687, Cl. 338-184.000.

Shimoda, Mituhiko: *See*—
Tomori, Yasumasa; and Shimoda, Mituhiko, 4,400,075, Cl. 354-195.000.

Shinagawa Refractories Co., Ltd.: *See*—
Okuda, Shigeru; Mori, Masashi; and Hayase, Masahiro, 4,400,334, Cl. 264-30.000.

Shinkarenko, Leonid I.: *See*—
Vishnevsky, Vladimir S.; Koval, Vitaly S.; Lavrinenko, Vyacheslav V.; Boichenko, Oleg L.; Kartashev, Igor A.; Golovyashin, Jury V.; Serov, Nikolai F.; Shinkarenko, Leonid I.; and Jurash, Oleg G., 4,400,641, Cl. 310-323.000.

Shinozaki, Nobuo: *See*—
Ogihara, Musuo; Shinozaki, Nobuo; Ishikawa, Tadashi; and Seki, Yoichi, 4,400,091, Cl. 368-80.000.

Shiokawa, Takayasu; and Karasawa, Yoshio, to Kokusai Denshin Denwa Kabushiki Kaisha. Spiral array antenna. 4,400,703, Cl. 343-895.000.

Shionogi & Co., Ltd.: *See*—
Morihara, Kazuyuki; Oka, Tatsushi; and Tsuzuki, Hiroshige, 4,400,465, Cl. 435-71.000.

Shiurila, John; and Williams, Richard A., to Centronics Data Computer Corp. Multi-color print head. 4,400,102, Cl. 400-124.000.

Shoji, Shigemasa, to TDK Electronics Co., Ltd. Magnetic tape cassette. 4,399,960, Cl. 242-199.000.

Shu, Stephen K., to Del Mar Avionics. Tape transport. 4,400,745, Cl. 360-73.000.

Shuman, Joseph G. Novel mattress pad. 4,399,574, Cl. 5-417.000.

Shutov, Gennady M.; Erdman, Maiya E.; Solomakha, Adel I.; and Kalennikov, Evgeny A., to Belorussky Politekhnichesky Institute. Wood modifying composition. 4,400,495, Cl. 524-176.000.

Siedenstrang, Roy W.; and Cornell, William H., to Phillips Petroleum Company. Thermoplastic elastomer compositions for low pressure molding. 4,400,483, Cl. 524-247.000.

Siegel, Rudolf: *See*—
Doetsch, Werner; Honig, Helmut; and Siegel, Rudolf, 4,400,367, Cl. 423-463.000.

Siegemund, Gunter: *See*—
Rammelt, Peter-Paul; and Siegemund, Gunter, 4,400,546, Cl. 568-386.000.

Siemens Aktiengesellschaft: *See*—
Aichinger, Horst; and Kranberg, Heinz E., 4,400,821, Cl. 378-97.000.
Diepold-Scharnitzky, Rudolf, 4,399,709, Cl. 73-861.770.
Freller, Helmut; and Schack, Peter, 4,400,254, Cl. 204-192.00P.
Haendle, Joerg, 4,400,823, Cl. 378-113.000.
Hohmann, Eugen, 4,400,357, Cl. 422-297.000.
Klar, Heinrich; and Roessler, Berward, 4,400,637, Cl. 307-497.000.
Kuhnke, Hermann; and Rattner, Manfred, 4,400,822, Cl. 378-103.000.
Rydval, Peter, 4,400,802, Cl. 365-226.000.
Schiffner, Gerhard; and Siemens Aktiengesellschaft, 4,400,088, Cl. 356-350.000.
Strelow, Horst, 4,400,792, Cl. 364-900.000.

Sierra Monitor Corporation: *See*—
Advani, Gulu N.; Beard, Robert; and Nanis, Leonard, 4,399,684, Cl. 73-1.00G.

Sikob Svensk Industris Konstruktions-Och Berakningskontor AB: *See*—
Jorgensen, Karl G.; Magnusson, Leif L.; and Olsson, Curt S., 4,399,745, Cl. 100-2.000.

Silano, Michael A.; and Featherston, Robert D., to National Starch and Chemical Corporation. Process for preparing corrugated paperboard. 4,400,480, Cl. 524-47.000.

Silchor: *See*—
Houle, Raymond T., 4,399,569, Cl. 4-555.000.

Simeth, Claus, to M.A.N.-Roland Druckmaschinen Aktiengesellschaft. Varnishing unit in the delivery unit of a sheet-fed rotary printing press. 4,399,767, Cl. 118-46.000.

Simmonds Precision Products, Inc.: *See*—
Wright, Fred, 4,400,022, Cl. 285-256.000.

Simmons U.S.A. Corporation: *See*—
Baright, Leslie I., 4,399,573, Cl. 5-239.000.
Callaway, Milton A., 4,399,576, Cl. 5-451.000.

Simms, Alfred P. Distribution module for multi-wire group. 4,400,047, Cl. 339-18.00R.

Simnar, Inc.: *See*—
Molnar, Robert, 4,399,588, Cl. 17-64.000.

Simon, Herbert: *See*—
Dziuba, Peter; and Simon, Herbert, 4,399,715, Cl. 74-15.660.

Simovits, Stephen J., Jr.; and Dumas, Christ J., to American Plasticraft Company. CRT Socket assembly. 4,400,645, Cl. 313-325.000.

Simpkin, Gordon T.: *See*—
Cross, Raymond P.; and Simpkin, Gordon T., 4,400,193, Cl. 65-114.000.

Singer Company, The: *See*—
Creed, Gerald J.; and Zylbert, Thaddeus J., 4,399,761, Cl. 112-242.000.

Singer, Hans S. Yarn package holder. 4,399,957, Cl. 242-130.000.

Singerman, Gary M.; Ryu, Yumi P.; and Anglin, James R., to Gulf Research & Development Company. Lubricating oils containing quaternary ammonium thiomolybdates. 4,400,282, Cl. 252-32.70E.

Sinnreich, Joel: *See*—
Batzer, Hans; and Sinnreich, Joel, 4,400,296, Cl. 252-364.000.

Siverling, Michael M., to International Business Machines Corporation. Servo system for data storage apparatus. 4,400,747, Cl. 360-77.000.

Sjardijn, Willem: *See*—
Goodall, Brian L.; van der Nat, Adrianus A.; and Sjardijn, Willem, 4,400,302, Cl. 252-429.00B.

SKF Industrial Trading and Development Co. B.V.: *See*—
Breward, Michael J.; and Ritchie, Andrew M. F., 4,399,899, Cl. 192-98.000.

SKF Kugellagerfabriken GmbH: *See*—
Olschewski, Armin; Brandenstein, Manfred; Walter, Lothar; and Kunkel, Heinrich, 4,399,898, Cl. 198-98.000.

Smanski, Philip J.: *See*—
Kaman, Richard A.; Felix, Kenneth A.; Smanski, Philip J.; and Haug, John R., 4,400,585, Cl. 179-2.0EB.

Smith, Arthur B.: *See*—
Pytlewski, Louis L.; Krevitz, Kenneth; and Smith, Arthur B., 4,400,552, Cl. 568-715.000.

Smith, Claude T. Fishing rod with bite signaling means. 4,399,631, Cl. 43-17.000.

Smith, J. Thomas: *See*—
Moschetti, Anthony P.; Smith, J. Thomas; Quackenbush, Carr L. W.; Lingertat, Helmut; and Nehring, Vincent W., 4,400,427, Cl. 428-332.000.

Smith, Stewart W.: *See*—
Leunig, Carl V.; and Smith, Stewart W., 4,400,186, Cl. 55-379.000.

Smith, Theo J., to Milling Specialties, Inc. Insert type milling cutter. 4,400,117, Cl. 407-49.000.

Smith, Thomas L., to Colamco, Inc. Laminated fabric havin, integral raised areas formed therein and method of making same. 4,400,422, Cl. 428-160.000.
Smith, Willard P.; and Hutchinson, Bruce R., to Stone-Platt Fluidfire Limited. Fluidized bed combustor distributor plate assembly. 4,400,150, Cl. 431-170.000.
Smiths Industries Public Limited Company: *See*—
Brown, Richard, 4,400,731, Cl. 358-139.000.
Smolanoff, Joel, to Rohm and Haas Company. Azaspiro compounds. 4,400,512, Cl. 546-16.000.
Smolikowski, Serge: *See*—
Herve, Jean J.; and Smolikowski, Serge, 4,400,392, Cl. 424-304.000.
SMS Schloemann-Siemag Aktiengesellschaft: *See*—
Hartmann, Hans-Heinrich; and Svagr, Alexandr, 4,399,680, Cl. 72-225.000.
Malinowski, Hans; Pielsticker, Klaus-Peter; and Linsinger, Ernst, 4,399,729, Cl. 83-455.000.
Snell, George J.; and Kydd, Paul H., to Hydrocarbon Research, Inc. Method for using fast fluidized bed dry bottom coal gasification. 4,400,181, Cl. 48-197.00R.
Snider, Harold F., to Therm-O-Disc, Incorporated. Snap acting switch for thermostats. 4,400,679, Cl. 337-382.000.
Societe Anonyme d'Explosifs et de Produits Chimiques: *See*—
Murphy, John M.; Spensley, Robert H.; and Ellis, John, 4,399,911, Cl. 206-219.000.
Societe Anonyme dite: VISIODIS: *See*—
Van Hulle, Erick, 4,400,726, Cl. 358-86.000.
Societe Europeenne De Propulsion: *See*—
Robert, Michel, 4,399,831, Cl. 137-154.000.
Societe Nationale des Poudres et Explosifs: *See*—
Deweerdt, Julien; Sala, Jacques; and Souyri, Denis, 4,400,329, Cl. 260-455.00B.
Societe Nationale Elf Aquitaine (Production): *See*—
Castel, Yvon; and Iato, Michel, 4,400,112, Cl. 405-224.000.
Soderstrom, Sture H.: *See*—
Alkner, Stig H. I.; and Soderstrom, Sture H., 4,399,765, Cl. 114-256.000.
Soldavini, Teodoro. Motorized lawn-mower, provided with a rigid cut grass collecting vessel, including a removable bag. 4,399,647, Cl. 56-202.000.
Solomakha, Adel I.: *See*—
Shutov, Gennady M.; Erdman, Maiya E.; Solomakha, Adel I.; and Kalennikov, Evgeny A., 4,400,495, Cl. 524-176.000.
Solymos, Andras: *See*—
Barsi, Karoly; Salamon, Hugo; Solymos, Andras; Takacs, Jozsef; and Toth, Istvan, 4,400,035, Cl. 299-11.000.
Somezawa, Masashi: *See*—
Konishi, Shin; Yoshida, Mitsuhiro; Katagiri, Masatake; Somezawa, Masashi; Ninomiya, Yoshinobu; and Hashimoto, Akira, 4,400,498, Cl. 528-60.000.
Sony Corporation: *See*—
Arai, Kiyoshi, 4,399,749, Cl. 101-211.000.
Ive, John G. S., 4,400,810, Cl. 371-40.000.
Konishi, Shin; Yoshida, Mitsuhiro; Katagiri, Masatake; Somezawa, Masashi; Ninomiya, Yoshinobu; and Hashimoto, Akira, 4,400,498, Cl. 528-60.000.
Mori, Hiroshi; and Sugiki, Mikio, 4,400,062, Cl. 350-406.000.
Sopory, Umesh K., to Raychem Corporation. PTC Devices and their preparation. 4,400,614, Cl. 219-528.000.
Sorensen, Jens O., to Universal Commerce and Finance N.V. Injection molding of thermoplastics in sandwich mold employing desynchronized opening, extended and closing periods. 4,400,341, Cl. 264-328.800.
Sorenson, John F., to Champion International Corporation. Machine foldable corner post. 4,399,915, Cl. 206-586.000.
Southland Corporation, The: *See*—
Iyer, Shankar S., 4,400,541, Cl. 568-56.000.
Southworth, Glen R.; McClelland, Larry R.; and Johnson, Bruce F., to Colorado Video Incorporated. Color slow-scan TV system and method. 4,400,717, Cl. 358-13.000.
Souyri, Denis: *See*—
Deweerdt, Julien; Sala, Jacques; and Souyri, Denis, 4,400,329, Cl. 260-455.00B.
Spangler, George M. Wound protector with transparent cover. 4,399,816, Cl. 128-154.000.
Sparks, John E.: *See*—
Schwartz, Robert C.; and Sparks, John E., 4,399,591, Cl. 19-202.000.
Spear, Reginald G. Thin solar cells. 4,400,577, Cl. 136-259.000.
Spears, James R. Method and apparatus for calibrating rapid sequence radiography. 4,400,827, Cl. 378-207.000.
Spectronics, Inc.: *See*—
Biard, James R.; Shaunfield, John E.; and Speer, Royce S., 4,400,054, Cl. 350-96.150.
Speer, Royce S.: *See*—
Biard, James R.; Shaunfield, John E.; and Speer, Royce S., 4,400,054, Cl. 350-96.150.
Speer, Stephen: *See*—
Evans, Hugh G.; Speer, Stephen; Christy, James S.; and Lafrenz, Stanley S., 4,399,665, Cl. 62-239.000.
Spelber, Leonard G.; and Tucker, Abraham I., to Wastemate Corp. Valve mechanism for a water operated waste disposal unit. 4,399,947, Cl. 241-46.00B.
Spencer Wright Industries, Inc.: *See*—
Bagnall, Arthur F., 4,399,758, Cl. 112-79.00R.
Spensley, Robert H.: *See*—
Murphy, John M.; Spensley, Robert H.; and Ellis, John, 4,399,911, Cl. 206-219.000.
Sperry Corporation: *See*—
Mayer, Arthur, 4,399,694, Cl. 73-178.00R.
Schaefer, Martin A., 4,400,660, Cl. 323-270.000.
Spiess, Fred N.; and Anderson, Victor C., to United States of America, Navy. Wide swath precision echo sounder. 4,400,803, Cl. 367-88.000.
Spitnale, Gregory G.: *See*—
Lemanski, Michael F.; Spitnale, Gregory G.; and Milberger, Ernest C., 4,400,522, Cl. 549-260.000.
Spriggs, Harold G.: *See*—
Albrecht, James W.; and Spriggs, Harold G., 4,400,638, Cl. 310-95.000.
Springer, Carl M.; Theis, Bernd O.; Wawra, Georg; and Juffa, Richard, to Binks Manufacturing Company; and Bayer Aktiengesellschaft. Flushable rotary gear pump. 4,400,147, Cl. 418-206.000.
Springs Mills, Inc.: *See*—
Everall, Palmer B., Jr.; and Lowery, Jack R., Sr., 4,399,991, Cl. 271-175.000.
Spry, Robert H.; Spry, Robert R.; and Koller, Gloria. Christmas tree stand. 4,399,973, Cl. 248-524.000.
Spry, Robert R.: *See*—
Spry, Robert H.; Spry, Robert R.; and Koller, Gloria, 4,399,973, Cl. 248-524.000.
Spynu, Gleb A.: *See*—
Pastushenko, Jury I.; Spynu, Gleb A.; Nazarenko, Oleg K.; Lokshin, Viktor E.; and Shapoval, Vladimir I., 4,400,609, Cl. 219-121.0EV.
Square D Company: *See*—
Rickmann, Bernard C., 4,400,599, Cl. 200-50.00C.
Squibb Vitatek, Inc.: *See*—
Sunderland, Richard A., 4,400,652, Cl. 315-387.000.
Staat der Nederlanden: *See*—
van Schie, Theodorus J. M., 4,399,980, Cl. 256-13.100.
Stabilus GmbH: *See*—
Freitag, Herbert; and Schnitzius, Klaus, 4,400,600, Cl. 200-52.00R.
Stache, Bernd; and Vogt, Dieter, to Buhler-Miag GmbH. Arrangement for piling a bulky material having different grain sizes. 4,400,268, Cl. 209-236.000.
Stahl, Roland; and Wiedenmann, Hans-Martin, to Robert Bosch GmbH. Shielded, heated electrochemical gas sensor. 4,400,260, Cl. 204-426.000.
Standard Oil Company, The: *See*—
Dria, Dennis E.; and Bremer, Noel J., 4,400,306, Cl. 252-431.00R.
Giddings, Brandford E.; Jorkasky, Richard J., II; and Thornton, Kim L., 4,400,484, Cl. 524-296.000.
Lemanski, Michael F.; Spitnale, Gregory G.; and Milberger, Ernest C., 4,400,522, Cl. 549-260.000.
Standard Oil Company (Indiana): *See*—
Arzoumanidis, Gregory G.; and Tovrog, Benjamin S., 4,400,494, Cl. 526-119.000.
Bauer, Keith A.; and Khosrovi, Behzad, 4,400,467, Cl. 435-104.000.
Beynet, Pierre A.; and Billington, Sam A., 4,400,110, Cl. 405-195.000.
Feld, Raymond C.; and Feinstein, Allen I., 4,400,573, Cl. 585-481.000.
Mukamal, Harold; Lamar, Richard S.; and Ferreira, Laurence E., 4,400,485, Cl. 524-444.000.
Palm, John W., 4,400,369, Cl. 423-574.00R.
Weil, Thomas A., 4,400,537, Cl. 564-402.000.
Stanislaw, Peter P.; and Hicks, James S., to Morrison Machine Co. Apparatus for stretching an endless web. 4,400,238, Cl. 162-273.000.
Stansky, William V., Jr.: *See*—
Dixit, Sunit S.; and Stansky, William V., Jr., 4,400,481, Cl. 524-55.000.
Stanton, Taki, to Universal Nominees Pty. Ltd. Dispensing method and apparatus. 4,399,845, Cl. 141-1.000.
Stark, Robert. Two part shoe brush. 4,399,580, Cl. 15-107.000.
Starr, Eugene W., to PPG Industries, Inc. Method and apparatus for producing heat-strengthened glass sheets having improved break patterns. 4,400,194, Cl. 65-114.000.
Stauffer Chemical Company: *See*—
Chin, Hsiao-Ling M., 4,400,203, Cl. 71-100.000.
Chin, Hsiao-Ling M., 4,400,529, Cl. 560-16.000.
Felix, Raymond A., 4,400,204, Cl. 71-100.000.
Teach, Eugene G., 4,400,200, Cl. 71-88.000.
Teach, Eugene G., 4,400,202, Cl. 71-94.000.
Wong, Rayman Y.; and Bunker, Nathan S., 4,400,330, Cl. 260-502.50F.
Stec, Raymond R.: *See*—
Stoneberg, Richard L.; and Stec, Raymond R., 4,400,487, Cl. 525-199.000.
Steinback, Clarence I., to Acrometal Products, Inc. Abrasive grinding machine. 4,399,637, Cl. 51-138.000.
Steiner, Peter: *See*—
McMahon, Joseph F.; and Steiner, Peter, 4,400,309, Cl. 252-472.000.
Steinweg, Klaus: *See*—
Schloemer, Gerhard; and Steinweg, Klaus, 4,399,641, Cl. 52-309.100.
Stenz, Paul P., to C. A. Weidmuller GmbH. Electrical plug and socket connectors. 4,400,051, Cl. 339-217.00S.
Stephen, Robert L., to University of Utah Research Foundation. Subcutaneous peritoneal injection catheter. 4,400,169, Cl. 604-49.000.

Stephens, James B.: *See—*
Youngberg, Charles L.; Miller, Charles G., deceased; Stephens, James B.; and Finnerty, Anthony A., 4,400,191, Cl. 65-21.400.

Stern, Richard M., to Riker Laboratories, Inc. Antimicrobial derivatives of 8-amino and 8-aminomethyl benzo(ij)quinolizine. 4,400,386, Cl. 424-258.000.

Stevenson, Christopher, to Mono Oakes Limited. Method and apparatus for producing cement or plaster. 4,399,946, Cl. 241-21.000.

Stewart, William S.: *See—*
Funk, Gary L.; Huang, Warren H.; and Stewart, William S., 4,400,784, Cl. 364-500.000.

Stiles, Donald E. Automatic stove damper control. 4,399,940, Cl. 236-1.00G.

Stillmunkes, Dean J., to Deere & Company. Operator mounting step for track-laying vehicles. 4,400,002, Cl. 280-164.00A.

Stobbs, William; Hines, Charles; and Light, Rickey W., to GTE Automatic Electric Labs Inc.; and GTE Labs Inc. Electronic voice network for a telephone subscriber's substation. 4,400,588, Cl. 179-81.00R.

Stock, William H.; and Holland, Bernard C., Jr., to Rockwell International Corporation. Controlled output force actuator. 4,399,968, Cl. 244-137.00R.

Stofer, Bruce C.: *See—*
Francis, Robert S.; and Stofer, Bruce C., 4,400,798, Cl. 365-174.000.

Stoltman, Donald D., to General Motors Corporation. Exhaust gas recirculation control. 4,399,798, Cl. 123-571.000.

Stone-Platt Fluidfire Limited: *See—*
Smith, Willard P.; and Hutchinson, Bruce R., 4,400,150, Cl. 431-170.000.

Stoneberg, Richard L.; and Stec, Raymond R., to PPG Industries, Inc. Textured fluorocarbon coating compositions. 4,400,487, Cl. 525-199.000.

Storm, David A., to Halcon SD Group, Inc., The. Process for oxidizing carbon monoxide in the presence of methacrolein. 4,400,364, Cl. 423-247.000.

Stout, Gregg W.: *See—*
Adkins, Joel E.; Stout, Gregg W.; and Johnston, Russell A., 4,399,871, Cl. 166-325.000.

Stover, Edward R., to United States of America, Air Force. Four-directional structure for reinforcement. 4,400,421, Cl. 428-113.000.

Strammello, Peter, Jr., to Zenith Radio Corporation. Multi-component video system controller. 4,400,735, Cl. 358-181.000.

Stratton, Lawrence J.: *See—*
Johnston, Reed H.; Jeffreys, Dennis C.; Stratton, Lawrence J.; and Welz, Albert W., Jr., 4,400,688, Cl. 340-310.00R.

Straughan, Clive: *See—*
Minnaar, Daniel; and Straughan, Clive, 4,400,122, Cl. 411-67.000.

Strauss, Georg: *See—*
Braun, Albert; Portz, Willi; Strauss, Georg; and Delhey, Hans-Martin, 4,400,292, Cl. 252-189.000.

Strelow, Horst, to Siemens Aktiengesellschaft. Dual-channel data processing system for railroad safety purposes. 4,400,792, Cl. 364-900.000.

Stricker, David K.: *See—*
O'Neill, Michael J.; Brautigam, Peter F.; and Stricker, David K., 4,399,882, Cl. 180-6.480.

Strigl, Reinhard, to Linde Aktiengesellschaft. Vaporization of small amounts of liquefied gases. 4,399,659, Cl. 62-52.000.

Stromag, Inc.: *See—*
Albrecht, James W.; and Spriggs, Harold G., 4,400,638, Cl. 310-95.000.

Strong, Edward: *See—*
Gargano, William L. B., 4,399,969, Cl. 244-145.000.

Stubblefield, Samuel M., Jr.: *See—*
Fehrmann, George L.; and Stubblefield, Samuel M., Jr., 4,399,971, Cl. 248-221.300.

Stumpf, Werner: *See—*
Madaus, Rolf; Stumpf, Werner; Gorler, Klaus; and Carcasona-Beltran, Alfonso, 4,400,535, Cl. 562-584.000.

Stutz, Michael; and Mitzkus, Jurgen, to REPA Feinstanzwerk GmbH. Air bags in motor vehicles. 4,400,010, Cl. 280-732.000.

Suarez, Tulio; and Jones, C. David, to Eli Lilly and Company. 3-Phenyl-4-benzoyl-1,2-dihydronaphthalenes. 4,400,543, Cl. 568-327.000.

Suda, Takayuki; and Yasuda, Koichi, to TDK Electronics Co., Ltd. Coil unit. 4,400,674, Cl. 336-65.000.

Sueyoshi, Toshinobu: *See—*
Hayashi, Yukihiro; Sueyoshi, Toshinobu; Hirai, Shigeo; Kishimoto, Mikio; Tashita, Katsunori; and Amemiya, Masahiro, 4,400,337, Cl. 264-82.000.

Sugie, Akihiko: *See—*
Sami, Shunsuke; Sugie, Akihiko; Ono, Keiichi; Kawakami, Hajime; Kojima, Atsuyuki; and Katsube, Junki, 4,400,393, Cl. 424-305.000.

Sugiki, Mikio: *See—*
Mori, Hiroshi; and Sugiki, Mikio, 4,400,062, Cl. 350-406.000.

Sugita, Shigeyoshi: *See—*
Ishikawa, Masashi; Shimada, Masatoshi; Okamoto, Katsutomo; Sugita, Shigeyoshi; Goto, Masayuki; Koizumi, Yukuo; and Kaneda, Osamu, 4,400,782, Cl. 364-481.000.

Sulewski, Richard J.: *See—*
Heitmann, William E.; and Sulewski, Richard J., 4,400,223, Cl. 148-12.00F.

Sumitomo Chemical Company, Limited: *See—*
Hanamura, Yoshimi; Yuyama, Masahiro; and Sakuramoto, Akira, 4,400,236, Cl. 159-2.00E.

Sami, Shunsuke; Sugie, Akihiko; Ono, Keiichi; Kawakami, Hajime; Kojima, Atsuyuki; and Katsube, Junki, 4,400,393, Cl. 424-305.000.

Sumitomo Electric Industries, Ltd.: *See—*
Miyake, Masayoshi; Ueoka, Isao; and Kawaguchi, Munetaka, 4,400,430, Cl. 428-383.000.
Yamanouchi, Shosuke; and Kojima, Keiichi, 4,400,580, Cl. 174-102.0SC.

Sumitomo Metal Industries, Ltd.: *See—*
Kudo, Takeo; Okada, Yasutaka; Moroishi, Taishi; Ikeda, Akio; Ohtani, Hiroo; and Yoshikawa, Kunihiko, 4,400,209, Cl. 420-443.000.
Kudo, Takeo; Okada, Yasutaka; Moroishi, Taishi; Ikeda, Akio; Ohtani, Hiroo; and Yoshikawa, Kunihiko, 4,400,210, Cl. 420-443.000.
Kudo, Takeo; Okada, Yasutaka; Moroishi, Taishi; Ikeda, Akio; Ohtani, Hiroo; and Yoshikawa, Kunihiko, 4,400,211, Cl. 420-443.000.
Kudo, Takeo; Okada, Yasutaka; Moroishi, Taishi; Ikeda, Akio; Ohtani, Hiroo; and Yoshikawa, Kunihiko, 4,400,349, Cl. 420-443.000.

Sumitomo Precision Products Company Limited: *See—*
Murakami, Masahiro; and Aotsuka, Kazuo, 4,400,610, Cl. 219-124.020.

Sumner, Terence E., to Motorola, Inc. Method and means of clock recovery in a received stream of digital data. 4,400,817, Cl. 375-119.000.

Sundeen, Arthur R.: *See—*
Romblom, Edward R.; and Sundeen, Arthur R., 4,399,799, Cl. 123-571.000.

Sunderland, Richard A., to Squibb Vitatek, Inc. Magnetic deflection sweep amplifier with intelligent flyback. 4,400,652, Cl. 315-387.000.

Sundgren, Anders J.: *See—*
Rehnberg, Ove A.; and Sundgren, Anders J., 4,400,352, Cl. 422-4.000.

Sundstrand Corporation: *See—*
Pollman, Frederic W., 4,399,886, Cl. 180-197.000.

Sundstrand Data Control Group: *See—*
Hulsing, Rand H., II; and Peters, Rex B., 4,399,692, Cl. 73-151.000.

Sundstrand Data Control, Inc.: *See—*
Hanson, Richard A., 4,399,700, Cl. 73-517.00B.

Suss, Hans U.: *See—*
Kruger, Horst; Berndt, Wilhelm; and Suss, Hans U., 4,400,237, Cl. 162-76.000.

Suttkus, David J.: *See—*
Drutchas, Gilbert H.; and Suttkus, David J., 4,400,144, Cl. 417-415.000.

Suzuki, Hirobumi: *See—*
Takeda, Hirofumi; and Suzuki, Hirobumi, 4,400,418, Cl. 428-36.000.

Suzuki, Hiroshi: *See—*
Osumi, Yasuaki; Suzuki, Hiroshi; Kato, Akihiko; Oguro, Keisuke; and Nakane, Masanori, 4,400,348, Cl. 420-443.000.

Suzuki, Isamu: *See—*
Komori, Shinichi; Shimanuki, Yasushi; and Suzuki, Isamu, 4,400,351, Cl. 420-489.000.

Suzuki, Isao: *See—*
Arai, Yoshio; Kataoka, Hiroyuki; Suzuki, Isao; and Itoh, Satoru, 4,400,737, Cl. 358-263.000.

Suzuki, Katsumichi, to Hitachi, Ltd. Method of measuring stress distribution in a solid body. 4,399,702, Cl. 73-597.000.

Suzuki, Mamoru: *See—*
Takahashi, Yoshinobu; Tokushima, Yasuo; Ogata, Kentarou; Suzuki, Mamoru; and Ito, Zyouzi, 4,400,416, Cl. 427-434.500.

Suzuki, Masayuki: *See—*
Miura, Yuzo; Katsuma, Makoto; and Suzuki, Masayuki, 4,400,076, Cl. 354-202.000.

Suzuki, Ryoichi; and Uchiyama, Takashi, to Canon Kabushiki Kaisha. Diaphragm device for a camera with interchangeable lenses. 4,400,072, Cl. 354-43.000.

Suzuki, Seigo; and Eguchi, Seiji, to Tokyo Shibaura Electric Co., Ltd. Multi-processor system with programmable memory-access priority control. 4,400,771, Cl. 364-200.000.

Suzuki, Toyotosi: *See—*
Tamura, Shuichi; Suzuki, Toyotosi; Tamamura, Hideo; and Matsuda, Mutsuhide, 4,400,071, Cl. 354-25.000.

Suzuki, Yasuhiko: *See—*
Nishio, Kanemitsu; Takagi, Shunichi; and Suzuki, Yasuhiko, 4,400,643, Cl. 313-11.500.

Suzuki, Yoshio: *See—*
Masuda, Naosuke; Suzuki, Yoshio; and Ohe, Takeshi, 4,400,139, Cl. 417-304.000.

Svagr, Alexandr: *See—*
Hartmann, Hans-Heinrich; and Svagr, Alexandr, 4,399,680, Cl. 72-225.000.

Swartzbaugh, Peter T.; and Harbauer, Paul W., to Owens-Illinois, Inc. Child resistant package. 4,399,920, Cl. 215-211.000.

Sweeney, William T., to Eurotech International Limited. Collector apparatus. 4,400,134, Cl. 415-62.000.

Switzer, Ralph V., to Aldon Company, The. Locking wheel block. 4,399,893, Cl. 188-32.000.

Synek, Jan; and Tentler, Michael, to United Networks, Inc.; and Manu-Tronics, Inc. Subscriber station network. 4,400,589, Cl. 179-81.00R.

Syntex (U.S.A.) Inc.: *See—*
McNaughton, Allen D.; Albert, Stephen B.; and Furbershaw, Gerard A., 4,400,170, Cl. 604-62.000.

Synthelabo: *See*—
Kaplan, Jean-Pierre; Jalfre, Naurice; and Giudicelli, Don P., 4,400,394, Cl. 424-319.000.
Kaplan, Jean-Pierre; and Raizon, Bernard, 4,400,536, Cl. 564-269.000.
Syrbius, Gerhard: *See*—
Koch, Klaus; and Syrbius, Gerhard, 4,400,218, Cl. 127-1.000.
Szabo, Lajos: *See*—
Szantay, Csaba; Szabo, Lajos; Kalaus, Gyorgy; Dancsi, Lajos; Keve, Tibor; Drexler, Ferenc; and Mihalyfi, Krisztina, 4,400,514, Cl. 546-51.000.
Szantay, Csaba; Szabo, Lajos; Kalaus, Gyorgy; Dancsi, Lajos; Keve, Tibor; Drexler, Ferenc; and Mihalyfi, Krisztina, to Richter Gedeon Vegyeszeti Gyar Rt. Process for the preparation of apovincaminic acid ester derivatives. 4,400,514, Cl. 546-51.000.
T.A.D. Avanti, Inc.: *See*—
Hanscom, Bradford E., 4,400,586, Cl. 179-6.110.
T & R Chemicals, Inc.: *See*—
Alvarez, Jose A. A.; and Thompson, Ralph B., 4,400,396, Cl. 424-325.000.
Arias Alvarez, Jose A.; and Thompson, Ralph B., 4,400,397, Cl. 424-329.000.
Tabler, Donald C.: *See*—
Johnson, Marvin M.; and Tabler, Donald C., 4,400,564, Cl. 585-845.000.
Taguchi, Sadanori; Honda, Yukio; Aida, Toshiyuki; and Kawabe, Ushio, to Hitachi, Ltd. Impregnated cathode. 4,400,648, Cl. 313-346.00R.
Tajima, Akira: *See*—
Ikemori, Keiji; and Tajima, Akira, 4,400,064, Cl. 350-426.000.
Takacs, Jozsef: *See*—
Barsi, Karoly; Salamon, Hugo; Solymos, Andras; Takacs, Jozsef; and Toth, Istvan, 4,400,035, Cl. 299-11.000.
Takada, Juichiro. Coupling device for connecting a drive element to a belt transfer member in a passive vehicle occupant restraint belt system. 4,400,014, Cl. 280-804.000.
Takada, Shinzo: *See*—
Isono, Masaru; Nunokawa, Kazuo; Kondo, Masayuki; and Takada, Shinzo, 4,400,070, Cl. 354-25.000.
Takada, Yasuo: *See*—
Arai, Tohru; Fujita, Hironori; and Takada, Yasuo, 4,400,224, Cl. 148-15.000.
Takagi, Osamu: *See*—
Asami, Fumitaka; and Takagi, Osamu, 4,400,615, Cl. 377-28.000.
Takagi, Shunichi: *See*—
Nishio, Kanemitsu; Takagi, Shunichi; and Suzuki, Yasuhiko, 4,400,643, Cl. 313-11.500.
Takahashi, Akio; Itoh, Yutaka; Shimazaki, Takeshi; Wajima, Motoyo; Morishita, Hirosada; Mizuno, Yutaka; Yokozawa, Shunya; and Tsukanishi, Kenji, to Hitachi Chemical Company, Ltd. Process for producing fire retardant and heat resistant copper-clad laminated board, and varnish therefor. 4,400,438, Cl. 428-458.000.
Takahashi, Akira: *See*—
Kamimura, Teturo; Komatsubara, Masahiro; Ando, Shizuo; Inanaga, Takuzi; and Takahashi, Akira, 4,400,744, Cl. 360-69.000.
Takahashi, Keishiro: *See*—
Nishizawa, Jun-ichi; Ohmi, Tadahiro; and Takahashi, Keishiro, 4,400,710, Cl. 357-15.000.
Takahashi, Kenji: *See*—
Kotera, Noboru; Eguchi, Shusaku; Teraoka, Masanori; Takahashi, Kenji; and Miyahara, Junji, 4,400,619, Cl. 250-327.200.
Takahashi, Yoshinobu; Tokushima, Yasuo; Ogata, Kentarou; Suzuki, Mamoru; and Ito, Zyouzi, to Toyota Jidosha Kogyo Kabushiki Kaisha. Method of surface treatment and an apparatus used in said surface treatment. 4,400,416, Cl. 427-434.500.
Takahashi, Yoshinobu: *See*—
Tokushima, Yasuo; Fukuta, Kenji; and Takahashi, Yoshinobu, 4,399,768, Cl. 118-423.000.
Takara Company: *See*—
Yoshiyuki, Hidetoshi, 4,400,044, Cl. 312-204.000.
Takasugi, Hisashi: *See*—
Takaya, Takao; Takasugi, Hisashi; Tsuji, Kiyoshi; and Chiba, Toshiyuki, 4,400,379, Cl. 424-246.000.
Takata, Kenichi: *See*—
Kondo, Tadasige; Ono, Susumu; and Takata, Kenichi, 4,399,801, Cl. 123-603.000.
Takaya, Takao; Takasugi, Hisashi; Tsuji, Kiyoshi; and Chiba, Toshiyuki, to Fujisawa Pharmaceutical Company, Limited. Cephem compounds. 4,400,379, Cl. 424-246.000.
Takayama, Chitoshi: *See*—
Takeda, Koji; Akahane, Masao; and Takayama, Chitoshi, 4,400,582, Cl. 179-1.0SM.
Takeda Chemical Industries, Ltd.: *See*—
Minato, Ichiro; Shibata, Koichi; and Fujinami, Kimiya, 4,400,525, Cl. 549-552.000.
Takeuchi, Tatsuro; Masaki, Sokukawa; and Ryuzo, Kimoto, 4,400,305, Cl. 252-430.000.
Takeda, Hirofumi; and Suzuki, Hirobumi, to M.M.T. Inc. Cylindrical covering fabric for a damping form roller of an offset printing machine. 4,400,418, Cl. 428-36.000.
Takeda, Koji; Akahane, Masao; and Takayama, Chitoshi, to Kabushiki, Kaisha Suwa Seikosha. Speech synthesizer. 4,400,582, Cl. 179-1.0SM.
Takeda, Renzo: *See*—
Izumi, Masayuki; and Takeda, Renzo, 4,400,343, Cl. 376-417.000.
Takegami, Yoshinobu; Inui, Tomoyuki; Ishihara, Takayuki; Araki, Eiichi; and Kanie, Toshihiro. Crystalline aluminosilicate zeolite catalyst and the method for manufacturing thereof. 4,400,328, Cl. 260-448.00C.
Takehira, Katsuomi; Ishikawa, Toshio; Hayakawa, Takashi; and Imamura, Juichi, to Director-General of the Agency of Industrial Science and Technology. Method for the preparation of cyclohexanone. 4,400,544, Cl. 568-360.000.
Takei, Hirofumi, to Nissan Motor Company, Limited. Engine mount. 4,399,974, Cl. 248-605.000.
Takemura, Shuji; Hirakawa, Kazumi; and Yoshizumi, Tsuneto, to Honshu Seishi Kabushiki Kaisha. Discharge recording medium. 4,400,706, Cl. 346-135.100.
Takeuchi, Tatsuro; Masaki, Sokukawa; and Ryuzo, Kimoto, to Takeda Chemical Industries, Ltd. Adsorbents comprising hydrated ferrites of Ti, Zr, and Sn and cured thermosetting resins. 4,400,305, Cl. 252-430.000.
Takeuchi, Yoshinobu; Kuroda, Katsuhiro; and Ozasa, Susumu, to Nippon Telegraph & Telephone Public Corporation; and Hitachi, Ltd. Electron lens equipment. 4,400,622, Cl. 250-396.0ML.
Takimoto, Hiroyuki; and Ushiro, Tatsuzo, to Canon Kabushiki Kaisha. Video camera and recorder. 4,400,743, Cl. 358-335.000.
Talbert Manufacturing, Inc.: *See*—
Losh, Russell L., 4,400,005, Cl. 280-423.00B.
Talmon, Wolfgang: *See*—
Dworak, Wilhelm; Muller, Karl-Heinz; Mayer, Siegfried; Talmon, Wolfgang; and Grabow, Kurt, 4,400,146, Cl. 418-131.000.
Tamamura, Hideo: *See*—
Tamura, Shuichi; Suzuki, Toyotosi; Tamamura, Hideo; and Matsuda, Mutsuhide, 4,400,071, Cl. 354-25.000.
Tamura, Shuichi; Suzuki, Toyotosi; Tamamura, Hideo; and Matsuda, Mutsuhide, to Canon Kabushiki Kaisha. Auto-focus camera. 4,400,071, Cl. 354-25.000.
Tanabe, Sadakazu: *See*—
Oshikubo, Yuji; and Tanabe, Sadakazu, 4,399,712, Cl. 73-864.160.
Tanabe, Shoji: *See*—
Kobayashi, Junichi; Mifune, Takao; and Tanabe, Shoji, 4,400,639, Cl. 310-215.000.
Tanabe, Yoshimitu: *See*—
Asano, Makoto; Kawashima, Saburo; Tanabe, Yoshimitu; and Murakami, Hisamichi, 4,400,492, Cl. 525-506.000.
Tanaka, Hideki: *See*—
Kobayashi, Kazuo; Tanaka, Hideki; Iida, Katsuyoshi; and Kamite, Junji, 4,399,791, Cl. 123-489.000.
Tanaka, Hiroki. Shortened antenna having coaxial lines as its elements. 4,400,702, Cl. 343-790.000.
Tanaka, Takayuki; Kadoi, Noriaki; and Yoshimoto, Akio, to Fuji Jukogyo Kabushiki Kaisha. System for controlling cooling water temperature for a water-cooled engine. 4,399,775, Cl. 123-41.080.
Tani, Keizo; and Hideshima, Makoto, to Tokyo Shibaura Denki Kabushiki Kaisha. Semiconductor device with glass layer contacting outer periphery of guard ring and adjacent substrate. 4,400,716, Cl. 357-54.000.
Tanigaki, Suzuyo. Picture display-image pickup apparatus. 4,400,725, Cl. 358-85.000.
Taniguchi, Yoshio: *See*—
Mitsuya, Munehisa; Terao, Motoyasu; Ota, Sakae; Taniguchi, Yoshio; Kaku, Toshimitsu; and Horigome, Shinkichi, 4,400,707, Cl. 346-135.100.
Tanson, Aloyse, to Continental Alloys S.A. Method of producing metal alloys. 4,400,207, Cl. 75-129.000.
Tashita, Katsunori: *See*—
Hayashi, Yukihiro; Sueyoshi, Toshinobu; Hirai, Shigeo; Kishimoto, Mikio; Tashita, Katsunori; and Amemiya, Masahiro, 4,400,337, Cl. 264-82.000.
Tatabanyai Szenbanyak: *See*—
Barsi, Karoly; Salamon, Hugo; Solymos, Andras; Takacs, Jozsef; and Toth, Istvan, 4,400,035, Cl. 299-11.000.
Taylor, Byron K.: *See*—
Manson, Ernest T.; and Taylor, Byron K., 4,400,806, Cl. 369-170.000.
Taylor, Gary N.: *See*—
Coquin, Gerald A.; Moran, Joseph M.; and Taylor, Gary N., 4,400,235, Cl. 156-643.000.
Taylor, Gordon C., to RCA Corporation. Method of forming metal lines. 4,400,257, Cl. 204-192.00E.
Taylor, Michael P.; and Oliphant, Jean R., to Rockwell International Corporation. Overflow and diversion to a foreign switch. 4,400,587, Cl. 179-27.00D.
Taylor, Robert D.: *See*—
Bruder, Frank J.; and Taylor, Robert D., 4,400,597, Cl. 200-6.00B.
TDK Electronics Co., Ltd.: *See*—
Izumi, Toshiaki; Maruta, Fumio; Kobuke, Takayoshi; and Noguchi, Kiyoshi, 4,400,444, Cl. 428-694.000.
Shoji, Shigemasa, 4,399,960, Cl. 242-199.000.
Suda, Takayuki; and Yasuda, Koichi, 4,400,674, Cl. 336-65.000.
Yoda, Kuniichi; Ohkawa, Takehisa; and Azegami, Hitoshi, 4,400,435, Cl. 428-425.900.
Teach, Eugene G., to Stauffer Chemical Company. Haloacyl and thiohaloacyl aryl-substituted oxazolidines and thiazolidines - herbicidal antidotes. 4,400,200, Cl. 71-88.000.
Teach, Eugene G., to Stauffer Chemical Company. N-m-Phenyl glutarimide derivatives and their use as herbicides. 4,400,202, Cl. 71-94.000.
Technic Design One N.V.: *See*—
de la Haye, Cornelis F., 4,400,003, Cl. 280-278.000.

Technicare Corporation: *See—*
Gardineer, Bayard; Mezrich, Reuben S.; and Leber, George W., 4,399,704, Cl. 73-642.000.
Teijin Limited: *See—*
Hagiwara, Tsuneo; and Horike, Akihiro, 4,400,519, Cl. 548-461.000.
Teixeira, Joao C.: *See—*
De Souza Dias, Edson; Santos, Luiz D. D.; Teixeira, Joao C.; Amorin, Osvaldo; and Lamprecht, Antonio R. D. A., 4,399,846, Cl. 141-192.000.
Tektronix, Inc.: *See—*
Berg, William E., 4,400,234, Cl. 156-634.000.
Francis, Robert S.; and Stofer, Bruce C., 4,400,798, Cl. 365-174.000.
Jurgensen, David J.; and Landsman, Howard A., 4,400,730, Cl. 358-139.000.
Olmstead, H. Wayne, 4,400,653, Cl. 315-408.000.
Telectronics Pty. Ltd.: *See—*
Cowdery, David, 4,399,819, Cl. 128-419.00P.
Money, David K., 4,399,818, Cl. 128-419.0PG.
Teledyne Industries, Inc.: *See—*
Hoettels, Ronald W., 4,399,777, Cl. 123-55.00R.
Teledyne Republic Manufacturing: *See—*
O'Connor, Terence A., 4,400,143, Cl. 417-374.000.
Tempmaster Corporation: *See—*
Dean, Raymond H., 4,399,739, Cl. 98-41.00R.
Tempo G: *See—*
Gutentag, Charles, 4,399,910, Cl. 206-0.820.
Tenney, Linwood P.: *See—*
Lane, Parley C., Jr.; Tenney, Linwood P.; and Wootton, Gerald V., 4,400,501, Cl. 528-496.000.
Tentler, Michael: *See—*
Synek, Jan; and Tentler, Michael, 4,400,589, Cl. 179-81.00R.
Terada, Atsusuke; and Misaka, Eiichi, to Sankyo Company, Limited. Analgesic and anti-inflammatory agents. 4,400,534, Cl. 562-468.000.
Terao, Motoyasu: *See—*
Mitsuya, Munehisa; Terao, Motoyasu; Ota, Sakae; Taniguchi, Yoshio; Kaku, Toshimitsu; and Horigome, Shinkichi, 4,400,707, Cl. 346-135.100.
Teraoka, Masanori: *See—*
Kotera, Noboru; Eguchi, Shusaku; Teraoka, Masanori; Takahashi, Kenji; and Miyahara, Junji, 4,400,619, Cl. 250-327.200.
Tetra Pak Developpement SA: *See—*
Nilsson, Erling I., 4,399,924, Cl. 220-257.000.
Texaco Inc.: *See—*
Darden, Jerome W.; Marquis, Edward T.; and Watts, Lewis W., Jr., 4,400,565, Cl. 585-10.000.
Marion, Charles P.; Brent, Albert; Richter, George N.; Crouch, William B.; Child, Edward T.; and Reynolds, Blake, 4,400,179, Cl. 48-86.00R.
Marion, Charles P.; Crouch, William B.; Brent, Albert; Richter, George N.; Child, Edward T.; and Reynolds, Blake, 4,400,180, Cl. 48-197.00R.
Texas Instruments Incorporated: *See—*
Closson, Thomas A.; Oxford, David B.; Schenck, Stephen R.; and Seitchik, Jerold A., 4,400,796, Cl. 365-8.000.
Cobb, Carleton M., III; Morin, Roland G.; and Hirsbrunner, Hans G., 4,400,677, Cl. 337-6.000.
Whitinger, Robert J., 4,400,809, Cl. 371-27.000.
Textilma AG: *See—*
Muller, Jakob, 4,399,841, Cl. 139-383.00R.
Thangathirupathy, Vellaiappan V. Safety device for use in aircraft and an aircraft provided with such safety device. 4,399,964, Cl. 244-113.000.
Thayer, Lundie P. Safety stirrup. 4,399,646, Cl. 54-49.000.
Thebert, Glenn W., to General Motors Corporation. Vane actuation system. 4,400,135, Cl. 415-134.000.
Theis, Bernd O.: *See—*
Springer, Carl M.; Theis, Bernd O.; Wawra, Georg; and Juffa, Richard, 4,400,147, Cl. 418-206.000.
Therm-O-Disc, Incorporated: *See—*
Snider, Harold F., 4,400,679, Cl. 337-382.000.
Thesenfitz, Klaus, to Linhoff & Thesenfitz Maschinenbau GmbH. Equipment for heating pulverulent products. 4,400,155, Cl. 432-151.000.
Theumer, Christoph, to Kretztechnik Gesellschaft mbH. Ultrasonic equipment for generating section images. 4,399,822, Cl. 128-660.000.
Theurer, Josef; and Pichler, Johann, to Franz Plasser Bahnbaumaschinen Industriegesellschaft mbH. Mobile track correction machine. 4,399,753, Cl. 104-7.00B.
Theurer, Josef; and Riessberger, Klaus, to Franz Plasser Bahnbaumaschinen Industriegesellschaft mbH. Track working or transport vehicle. 4,399,881, Cl. 177-137.000.
Thomas Conveyor Company, Inc.: *See—*
Millsap, Cecil E., 4,399,906, Cl. 198-662.000.
Thomas, Frank A. Method of removing phosphate materials from deproteinized cheese whey. 4,400,315, Cl. 260-112.00R.
Thomas, Michael W., to Westinghouse Electric Corp. Transformer with impedance matching means. 4,400,675, Cl. 336-160.000.
Thomas, Robert D., to General Motors Corporation. Method of molding a hollow retainer in a foam article. 4,400,336, Cl. 264-46.700.
Thompson, Ralph B.: *See—*
Alvarez, Jose A. A.; and Thompson, Ralph B., 4,400,396, Cl. 424-325.000.
Arias Alvarez, Jose A.; and Thompson, Ralph B., 4,400,397, Cl. 424-329.000.
Thomson-CSF: *See—*
Dupressoir, Albert, 4,400,701, Cl. 343-725.000.
Legrand, Jacques, 4,400,671, Cl. 335-56.000.
Micheron, Francois, 4,400,634, Cl. 307-400.000.
Thorne, William D., to International Business Machines Corp. Multiplexed hammer dot band matrix printer. 4,399,748, Cl. 101-93.040.
Thornton, Kim L.: *See—*
Giddings, Brandford E.; Jorkasky, Richard J., II; and Thornton, Kim L., 4,400,484, Cl. 524-296.000.
Tienari, Ossi, to OY Tampella AB. Reversing mechanism for the direction of rotation in a drilling apparatus. 4,399,876, Cl. 173-147.000.
Tiitto, Reijo: *See—*
Anttila, Arjo; and Tiitto, Reijo, 4,400,130, Cl. 414-478.000.
Timex Corporation: *See—*
Namyslo, Wilhelm, 4,400,095, Cl. 368-321.000.
Timken Company, The: *See—*
Otto, Dennis L., 4,399,998, Cl. 277-134.000.
Toth, David G.; Trump, Robert S.; and Leibensperger, Robert L., 4,400,040, Cl. 308-187.000.
Timmermans, Petrus B. M. W. M.: *See—*
Innemee, Hendricus C.; van Meel, Jacobus C. A.; De Jonge, Adriaan; Timmermans, Petrus B. M. W. M.; and van Zwieten, Pieter A., 4,400,378, Cl. 424-244.000.
Timmins, Cyril: *See—*
Davies, Haydn S.; Garstang, James H.; and Timmins, Cyril, 4,400,182, Cl. 48-214.00A.
Timmler, Helmut; Buchel, Karl H.; Brandes, Wilhelm; Frohberger, Paul-Ernst; and Scheinpflug, Hans, to Bayer Aktiengesellschaft. Fungicidal 1-phenyl-2-(1,2,4-triazol-1-yl)-ethyl ethers. 4,400,388, Cl. 424-269.000.
Tippets, Wayne M. Accounting apparatus and method. 4,400,016, Cl. 283-66.00R.
Tjushevsky, Vladimir M.: *See—*
Shevakin, Jury F.; Seidaliev, Fikrat; S.; Tjushevsky, Vladimir M.; Krasovsky, Jury V.; Glebova, Erika D.; and Chivikin, Valery K., 4,400,605, Cl. 219-61.000.
Tock, Graham: *See—*
Cohen, Barry J.; Scaramuzza, Joseph; and Tock, Graham, 4,399,943, Cl. 239-125.000.
Todd, Walter. Load lowering apparatus. 4,399,889, Cl. 182-6.000.
Todokoro, Masatoshi. Toy vehicle. 4,399,883, Cl. 180-65.00E.
Todoroki, Tsunehiko: *See—*
Ogawa, Yasuhiro; Shida, Sankichi; Honjo, Katsuhiko; and Todoroki, Tsunehiko, 4,400,214, Cl. 106-1.130.
Toffolon, Roger L.; and Kart, Warren E., to Toffolon, Roger L.; and Atlantic Pipe Corporation. Concrete pipe making machine with redensification apparatus. 4,400,149, Cl. 425-262.000.
Tokushima, Yasuo; Fukuta, Kenji; and Takahashi, Yoshinobu, to Toyota Jidosha Kogyo Kabushiki Kaisha. Apparatus for the surface treatment of an object. 4,399,768, Cl. 118-423.000.
Tokushima, Yasuo: *See—*
Takahashi, Yoshinobu; Tokushima, Yasuo; Ogata, Kentarou; Suzuki, Mamoru; and Ito, Zyouzi, 4,400,416, Cl. 427-434.500.
Tokyo Kogaku Kikai Kabushiki Kaisha: *See—*
Isono, Masaru; Nunokawa, Kazuo; Kondo, Masayuki; and Takada, Shinzo, 4,400,070, Cl. 354-25.000.
Tokyo Shibaura Denki Kabushiki Kaisha: *See—*
Aisaka, Tatsuyoshi; Kawai, Mituo; Hasegawa, Suteto; and Nawai, Takeo, 4,400,346, Cl. 376-327.000.
Mitsui, Hisayasu, 4,400,676, Cl. 336-205.000.
Nozaki, Masaharu; Nakamura, Hiroshi; and Miki, Yusaku, 4,400,775, Cl. 364-200.000.
Ozeki, Takeshi; and Ohshima, Shigeru, 4,400,055, Cl. 350-96.150.
Shidara, Tokihiko, 4,400,824, Cl. 378-141.000.
Tani, Keizo; and Hideshima, Makoto, 4,400,716, Cl. 357-54.000.
Wagatsuma, Yuuji; and Naruo, Hideaki, 4,400,608, Cl. 219-107.000.
Tokyo Shibaura Electric Co., Ltd.: *See—*
Suzuki, Seigo; and Eguchi, Seiji, 4,400,771, Cl. 364-200.000.
Tomaszewski, Lillie C., to Occidental Chemical Corporation. Electrolytic stripping process. 4,400,248, Cl. 204-146.000.
Tominaga, Tamotsu, to Hitachi Denshi Kabushiki Kaisha. Video head drum for video tape recorders. 4,400,751, Cl. 360-107.000.
Tomita, Yukio; Wakabayashi, Takayuki; Oda, Noriyuki; and Yamamoto, Hirotaka, to Hitachi Shipbuilding and Engineering Company Limited. System for recovering pressure and sensible heat from blast furnace gas with use of dry-type dust collector. 4,400,184, Cl. 55-106.000.
Tomlinson, Christopher J., to Burroughs Corporation. Parallel access computer memory system employing a power-of-two memory modules. 4,400,768, Cl. 364-200.000.
Tomori, Yasumasa; and Shimoda, Mituhiko, to Asahi Kogaku Kogyo Kabushiki Kaisha. Automatic focus camera with interchangeable lens. 4,400,075, Cl. 354-195.000.
Tomory, Ronald S.; and Odorczyk, James M., to Xerox Corporation. Image signal processing method and apparatus. 4,400,738, Cl. 358-283.000.
Tomy Kogyo Co., Inc.: *See—*
Iseki, Takeo, 4,399,632, Cl. 46-16.000.
Toppan Printing Co., Ltd.: *See—*
Ushijima, Hideru, 4,400,252, Cl. 204-181.00R.
Toray Industries, Inc.: *See—*
Hatada, Kenji; Yokura, Miyoshi; and Kobayashi, Hiroaki, 4,400,424, Cl. 428-212.000.
Tortrix A/S: *See—*
Pedersen, Jan B., 4,399,950, Cl. 242-4.00B.
Tosaka, Yoichi; Uchidoi, Masanori; Shigeta, Yoshihiro; Yoshikawa, Ryoichi; and Haraguchi, Shosuke, to Canon Kabushiki Kaisha.

Safety device for a camera with a winding motor. 4,400,073, Cl. 354-173.000.
TOSO Kabushiki Kaisha: *See—*
Honma, Kazuo, 4,399,857, Cl. 160-323.00R.
Toth, David G.; Trump, Robert S.; and Leibensperger, Robert L., to Timken Company, The. Tapered roller bearing with improved lubricating means. 4,400,040, Cl. 308-187.000.
Toth, Istvan: *See—*
Barsi, Karoly; Salamon, Hugo; Solymos, Andras; Takacs, Jozsef; and Toth, Istvan, 4,400,035, Cl. 299-11.000.
Tovrog, Benjamin S.: *See—*
Arzoumanidis, Gregory G.; and Tovrog, Benjamin S., 4,400,494, Cl. 526-119.000.
Towle Manufacturing Company: *See—*
Cuppett, Darrell J., 4,399,720, Cl. 81-3.370.
Towns, Tony L.: *See—*
Freebairn, Hugh T.; and Towns, Tony L., 4,400,291, Cl. 252-188.30R.
Toy, Wing N., to Bell Telephone Laboratories, Incorporated. Cache addressing arrangement in a computer system. 4,400,774, Cl. 364-200.000.
Toyo Jozo Kabushiki Kaisha: *See—*
Katsuragi, Shigeo; Morita, Kaoru; Kobari, Sadami; Noda, Toshiharu; Nakagawa, Nobuaki; and Watanabe, Susumu, 4,400,316, Cl. 260-112.50R.
Toyo Kogyo Co., Ltd.: *See—*
Kobayashi, Kazuo; Tanaka, Hideki; Iida, Katsuyoshi; and Kamitc, Junji, 4,399,791, Cl. 123-489.000.
Toyoda Koki Kabushiki Kaisha: *See—*
Hotta, Shigeo; and Yamamoto, Katsumi, 4,400,781, Cl. 364-474.000.
Yamakage, Tetsuro; Yoneda, Takao; and Imamura, Kohsei, 4,400,118, Cl. 408-3.000.
Toyota Jidosha Kabushiki Kaisha: *See—*
Kato, Keigo; Ando, Masahisa; and Kuroiwa, Yosio, 4,399,796, Cl. 123-549.000.
Toyota Jidosha Kogyo Kabushiki Kaisha: *See—*
Funato, Masayoshi; and Watanabe, Katunori, 4,399,717, Cl. 74-339.000.
Katagiri, Masayoshi; Ogura, Osamu; and Fujii, Takashi, 4,399,735, Cl. 91-369.00B.
Kosuge, Shuichi; Ogura, Hiroshi; Arai, Hiroshi; and Ohta, Hisatoshi, 4,400,779, Cl. 364-442.000.
Kubo, Seitok; Kuramochi, Koujiro; and Kyushima, Tatsuo, 4,399,895, Cl. 192-3.290.
Ryu, Nobuyuki, 4,400,015, Cl. 280-807.000.
Takahashi, Yoshinobu; Tokushima, Yasuo; Ogata, Kentarou; Suzuki, Mamoru; and Ito, Zyouzi, 4,400,416, Cl. 427-434.500.
Tokushima, Yasuo; Fukuta, Kenji; and Takahashi, Yoshinobu, 4,399,768, Cl. 118-423.000.
Tracy, Gary B.; and Leggett, Geary M. Portable lift for handicapped persons. 4,399,570, Cl. 4-561.000.
Traino, James C.; Micco, Felice A.; and Keene, Douglas L., to Xerox Corporation. Intensity control for raster output scanners. 4,400,740, Cl. 358-293.000.
Trane Company, The: *See—*
Derosier, Gregory S., 4,399,664, Cl. 62-238.700.
Treffner, Charles: *See—*
Treffner, Peter; and Treffner, Charles, 4,399,948, Cl. 241-152.00A.
Treffner, Peter; and Treffner, Charles. Pulverizer. 4,399,948, Cl. 241-152.00A.
Trelleborg AB: *See—*
Alkner, Stig H. I.; and Soderstrom, Sture H., 4,399,765, Cl. 114-256.000.
Tremco, Incorporated: *See—*
Rundo, John R., 4,400,338, Cl. 264-171.000.
Triad Corporation: *See—*
Damratowski, Harold; and Jenson, Jerry, 4,399,914, Cl. 206-533.000.
Tribe, Leonard T., to Kelsey-Hayes Company. Push rod slack adjuster. 4,399,894, Cl. 188-71.900.
Trick, Robert E.: *See—*
Finney, Roy P.; Lynch, Henry W.; and Trick, Robert E., 4,399,811, Cl. 128-79.000.
Trimarco, Emil P.; and Kalish, Norman S. Support structure for mounting heavy objects. 4,399,975, Cl. 248-678.000.
Trochoid Power Corporation: *See—*
Hoffmann, Ralph, 4,400,145, Cl. 418-61.00A.
Troutman, Ronald R.: *See—*
Dash, Somanath; Garnache, Richard R.; and Troutman, Ronald R., 4,399,605, Cl. 29-571.000.
Trump, Robert S.: *See—*
Toth, David G.; Trump, Robert S.; and Leibensperger, Robert L., 4,400,040, Cl. 308-187.000.
TRW, Inc.: *See—*
Drutchas, Gilbert H.; and Suttkus, David J., 4,400,144, Cl. 417-415.000.
Hayden, Rodney; and Guarasci, Mario, 4,400,761, Cl. 361-400.000.
Tsai, Kuo L. Self-shut type lock device. 4,399,674, Cl. 70-364.00A.
Tsuboi, Hikotada: *See—*
Oba, Masayuki; Kawamata, Motoo; Tsuboi, Hikotada; and Koga, Nobuhito, 4,400,521, Cl. 548-549.000.
Tsuji, Kiyoshi: *See—*
Takaya, Takao; Takasugi, Hisashi; Tsuji, Kiyoshi; and Chiba, Toshiyuki, 4,400,379, Cl. 424-246.000.
Tsukanishi, Kenji: *See—*
Takahashi, Akio; Itoh, Yutaka; Shimazaki, Takeshi; Wajima, Motoyo; Morishita, Hirosada; Mizuno, Yutaka; Yokozawa, Shunya; and Tsukanishi, Kenji, 4,400,438, Cl. 428-458.000.
Tsukasaki, Hidaka, to Nippondenso Co., Ltd. Engine preheating control system having automatic control of glow plug current. 4,399,781, Cl. 123-179.00H.
Tsutsumi, Saburo, to Nissan Motor Co., Ltd. Apparatus for controlling temperature of internal combustion engine. 4,399,774, Cl. 123-41.100.
Tsuzuki, Hiroshige: *See—*
Morihara, Kazuyuki; Oka, Tatsuhi; and Tsuzuki, Hiroshige, 4,400,465, Cl. 435-71.000.
Tucker, Abraham I.: *See—*
Spelber, Leonard G.; and Tucker, Abraham I., 4,399,947, Cl. 241-46.00B.
Tunick, Abraham L., to Karmelkorn Shoppes, Inc. Caramel or candy apple carton. 4,399,939, Cl. 229-52.00B.
Tunnerhoff, Dieter. Chess game automatic continuation circuit. 4,399,995, Cl. 273-237.000.
Tuzzolino, Carmen J. Plaster surface finishing device. 4,399,581, Cl. 15-176.000.
Tyler Refrigeration Corporation: *See—*
Ibrahim, Fayez F., 4,399,662, Cl. 62-82.000.
U-S Safety Trolley Corporation: *See—*
Ross, Donald R., Sr., 4,400,592, Cl. 191-34.000.
UBE Industries, Ltd.: *See—*
Fukui, Kiyoshi; Kakeya, Noboru; Jibiki, Hiroshi; and Matsuo, Fumio, 4,400,508, Cl. 544-313.000.
Uchida, Norimasa, to Hitachi Metals, Ltd. Method for treating surfaces. 4,400,222, Cl. 148-6.110.
Uchidoi, Masanori: *See—*
Tosaka, Yoichi; Uchidoi, Masanori; Shigeta, Yoshihiro; Yoshikawa, Ryoichi; and Haraguchi, Shosuke, 4,400,073, Cl. 354-173.000.
Uchiyama, Takashi: *See—*
Suzuki, Ryoichi; and Uchiyama, Takashi, 4,400,072, Cl. 354-43.000.
Ueda, Masakazu: *See—*
Noyori, Tatsuhiko; Ueda, Masakazu; Aoki, Masanobu; Kajima, Takashi; and Masuda, Tsuneharu, 4,399,676, Cl. 72-40.000.
Ueda, Syuzo: *See—*
Ishikawa, Masaaki; Ueda, Syuzo; and Imanaka, Makoto, 4,400,225, Cl. 148-36.000.
Ueoka, Isao: *See—*
Miyake, Masayoshi; Ueoka, Isao; and Kawaguchi, Munetaka, 4,400,430, Cl. 428-383.000.
Uetrecht, Dale M., to Baldwin Piano & Organ Company. Period proportional two-phase voltage controlled oscillator. 4,400,668, Cl. 331-45.000.
Ullrich, Martin: *See—*
Rathjen, Claus; and Ullrich, Martin, 4,400,175, Cl. 23-295.00R.
Ulmer, Harry E.: *See—*
Mathew, Chempolil T.; and Ulmer, Harry E., 4,400,527, Cl. 556-422.000.
Ungar, Israel S.: *See—*
Scher, Herbert I.; and Ungar, Israel S., 4,400,423, Cl. 428-204.000.
Unikat AB: *See—*
Rehnberg, Ove A.; and Sundgren, Anders J., 4,400,352, Cl. 422-4.000.
Union Carbide Corporation: *See—*
Abatjoglou, Anthony G.; and Billig, Ernst, 4,400,548, Cl. 568-454.000.
Baskent, Feyyaz O.; and Reedy, James D., 4,400,327, Cl. 260-429.00R.
Blomgren, George E.; and Kronenberg, Marvin L., 4,400,453, Cl. 429-196.000.
Colon, Ismael, 4,400,499, Cl. 528-174.000.
Colon, Ismael, 4,400,566, Cl. 585-359.000.
D'Silva, Themistocles D. J., 4,400,389, Cl. 424-300.000.
Frost, Albert C., 4,400,575, Cl. 585-733.000.
Gibson, Charles A.; and Winters, John R., 4,400,539, Cl. 564-480.000.
Kanner, Bernard; Schilling, Curtis L., Jr.; and Hopper, Steven P., 4,400,526, Cl. 556-420.000.
Vogler, William E., Jr.; and Halvorson, Thomas G., 4,399,660, Cl. 62-52.000.
Union Oil Company of California: *See—*
Jessup, Peter; Holstedt, Richard A.; and Baron, Kenneth, 4,400,284, Cl. 252-49.600.
Union Rheinische Braunkohlen Kraftstoff Aktiengesellschaft: *See—*
Keim, Karl-Heinz; and Korff, Joachim, 4,400,551, Cl. 568-487.000.
Unisearch Limited: *See—*
Dunlop, John I., 4,399,701, Cl. 73-579.000.
Unisert Systems, Inc.: *See—*
Fruck, Benant E., 4,400,019, Cl. 285-55.000.
United Kingdom of Great Britain and Northern Ireland, The Secretary of State for Defence in Her Britannic Majesty's Government of the: *See—*
Fairhurst, David, 4,400,250, Cl. 204-180.00R.
United Kingdom of Great Britain and Northern Ireland, The Secretary of State for Industry in Her Britannic Majesty's Government of the: *See—*
Pollard, Ian E.; and Hawkins, Keith C., 4,400,332, Cl. 261-1.000.
United Networks, Inc.: *See—*
Synek, Jan; and Tentler, Michael, 4,400,589, Cl. 179-81.00R.
United States of America
Agriculture: *See—*

Connick, William J., Jr., 4,400,391, Cl. 424-304.000.
Pickett, Teddy L.; and Edwards, Jerry L., 4,400,114, Cl. 405-303.000.

Air Force: *See—*
Daniel, Michael R.; Adam, John D.; and Moore, Robert A., 4,400,669, Cl. 333-141.000.
Mick, John C., 4,399,733, Cl. 89-1.50B.
Rahilly, W. Patrick, 4,400,221, Cl. 148-1.500.
Reinhardt, Bruce A.; and Arnold, Fred E., 4,400,540, Cl. 568-31.000.
Stover, Edward R., 4,400,421, Cl. 428-113.000.
Yuan, Han-Tzong; and Anderson, Roger N., 4,400,411, Cl. 427-86.000.

Army: *See—*
Durenec, Peter; and Holt, Steven L., 4,399,661, Cl. 62-65.000.
Fields, Craig I., 4,400,724, Cl. 358-85.000.
Mitchell, Robert R., 4,399,961, Cl. 244-3.130.
Rittenbach, Otto E.; and Olesch, Reinhard G., 4,400,695, Cl. 340-566.000.
Rittenbach, Otto E., 4,400,700, Cl. 343-55.00A.

Energy: *See—*
Duncan, Charles P., 4,399,629, Cl. 43-4.000.

National Aeronautics and Space Administration: *See—*
Kiraly, Louis J., 4,400,642, Cl. 310-332.000.
Nola, Frank J., 4,400,657, Cl. 318-798.000.
Youngberg, Charles L.; Miller, Charles G., deceased; Stephens, James B.; and Finnerty, Anthony A., 4,400,191, Cl. 65-21.400.

Navy: *See—*
Konrad, William L., 4,400,804, Cl. 367-137.000.
Menz, D. Darrell, 4,399,764, Cl. 114-219.000.
Spiess, Fred N.; and Anderson, Victor C., 4,400,803, Cl. 367-88.000.
Wagaman, Kerry L.; and Henderson, Larry D., 4,400,562, Cl. 568-903.000.

United Technologies Corporation: *See—*
McVay, Donald R.; and Setzer, Herbert J., 4,400,356, Cl. 422-171.000.

Universal Commerce and Finance N.V.: *See—*
Sorensen, Jens O., 4,400,341, Cl. 264-328.800.

Universal Foam Systems, Inc.: *See—*
Harding, Gary C., 4,399,930, Cl. 222-145.000.

Universal Nominees Pty. Ltd.: *See—*
Stanton, Taki, 4,399,845, Cl. 141-1.000.

University of California, The Regents of the: *See—*
Michelson, Robin P., 4,400,590, Cl. 179-107.0FD.

University of Florida: *See—*
Butler, George B.; Hogen-Esch, Thieo E.; Meister, John J.; and Pledger, Huey, Jr., 4,400,496, Cl. 527-312.000.

University of Utah Research Foundation: *See—*
Stephen, Robert L., 4,400,169, Cl. 604-49.000.

UOP Inc.: *See—*
Lamb, Richard C., 4,399,667, Cl. 62-382.000.
Robinson, Delmar W., 4,400,571, Cl. 585-480.000.

Upjohn Company, The: *See—*
Huber, Joel E., 4,400,524, Cl. 549-369.000.
Wierenga, Wendell, 4,400,518, Cl. 548-433.000.

Ushijima, Hideru, to Toppan Printing Co., Ltd. Method of manufacturing metal decorative panel having colored depressions. 4,400,252, Cl. 204-181.00R.

Ushiro, Tatsuzo: *See—*
Takimoto, Hiroyuki; and Ushiro, Tatsuzo, 4,400,743, Cl. 358-335.000.

USS Engineers & Consultants, Inc.: *See—*
Copperthwaite, Martin; and Roberts, Michael A., 4,400,474, Cl. 501-119.000.

USV Pharmaceutical Corporation: *See—*
Brown, Richard E.; St. Georgiev, Vassil; Kropp, Philip; and Loev, Bernard, 4,400,382, Cl. 424-250.000.

Utiger, Urs: *See—*
Posnansky, Mario; and Utiger, Urs, 4,399,919, Cl. 215-13.00R.

Valeo: *See—*
Billet, Rene; and Bacher, Michel, 4,399,897, Cl. 192-89.00B.
Poujol, Yves, 4,399,838, Cl. 137-625.290.

Vallhonrat, Juan B.: *See—*
Vivian, John; Cooper, Patrick R.; Higgins, Ronald B.; Harlan, John A.; Perry, Paul M.; Vallhonrat, Juan B.; and Golden, Donald P., Jr., 4,400,778, Cl. 364-200.000.

Valmet OY: *See—*
Anttila, Arjo; and Tiitto, Reijo, 4,400,130, Cl. 414-478.000.

Van Doorne's Transmissie B.V.: *See—*
Cadee, Theodorus P. M., 4,400,164, Cl. 474-12.000.

Van Dorn Company: *See—*
Fundom, Danny L., 4,399,925, Cl. 220-269.000.

Vandehey, Marvin E., to Boeing Company, The. Angle lag control methods and apparatus for long ground vehicles. 4,399,884, Cl. 180-79.100.

Van Den Broeke, Julien: *See—*
Vanderputten, Robert; Vandewalle, Oscar; and Van Den Broeke, Julien, 4,400,219, Cl. 127-23.000.

van der Meer, Johannes: *See—*
Arkenbout, Gerardus J.; van Kuijk, Albert; van der Meer, Johannes; and Schneiders, Leonardus H. J. M., 4,400,189, Cl. 62-538.000.

van der Nat, Adrianus A.: *See—*
Goodall, Brian L.; van der Nat, Adrianus A.; and Sjardijn, Willem, 4,400,302, Cl. 252-429.00B.

Vanderputten, Robert; Vandewalle, Oscar; and Van Den Broeke, Julien, to Graanderivatan Raffinaderijen Amylum, in het kort: G.R. Amylum, vroeger Glucose ries reunies genoemd. Plant for continuously preparing starch glue. 4,400,219, Cl. 127-23.000.

Vandewalle, Oscar: *See—*
Vanderputten, Robert; Vandewalle, Oscar; and Van Den Broeke, Julien, 4,400,219, Cl. 127-23.000.

Vanha, Vladimir. High impact chemically activated polyester fiber reinforced plastic composite. 4,400,425, Cl. 428-246.000.

Van Hulle, Erick, to Societe Anonyme dite: VISIODIS. Television signal distribution equipment for a cable network and including a stabilizer. 4,400,726, Cl. 358-86.000.

van Kuijk, Albert: *See—*
Arkenbout, Gerardus J.; van Kuijk, Albert; van der Meer, Johannes; and Schneiders, Leonardus H. J. M., 4,400,189, Cl. 62-538.000.

van Meel, Jacobus C. A.: *See—*
Innemee, Hendricus C.; van Meel, Jacobus C. A.; De Jonge, Adriaan; Timmermans, Petrus B. M. W. M.; and van Zwieten, Pieter A., 4,400,378, Cl. 424-244.000.

VanMeenen, Freddy: *See—*
De Bradandere, Joan; and VanMeenen, Freddy, 4,399,593, Cl. 24-25.000.

van Schie, Theodorus J. M., to Staat der Nederlanden. Obstacle protector means. 4,399,980, Cl. 256-13.100.

Van Scoy, Davis A., to Grove Valve and Regulator Company. Orifice meter with rotatable isolation sealing member. 4,399,708, Cl. 73-861.610.

van Zwieten, Pieter A.: *See—*
Innemee, Hendricus C.; van Meel, Jacobus C. A.; De Jonge, Adriaan; Timmermans, Petrus B. M. W. M.; and van Zwieten, Pieter A., 4,400,378, Cl. 424-244.000.

Varian Associates, Inc.: *See—*
Fruzzetti, Paul, 4,399,690, Cl. 73-40.700.
Giebeler, Robert H., Jr., 4,400,650, Cl. 315-5.410.

Vatsky, Joel, to Foster Wheeler Energy Corporation. Controlled flow, split stream burner assembly. 4,400,151, Cl. 431-184.000.

VEB Filmfabrik Wolfen: *See—*
Walkow, Fred; Czerney, Peter; Hartmann, Horst; and Marx, Jorg, 4,400,458, Cl. 430-157.000.

Vertut, Jean: *See—*
Biancale, Pierre; Corfa, Yves-Paul; Lemercier, Pierre; Moreau, Jean-Pierre; and Vertut, Jean, 4,400,115, Cl. 405-303.000.

Viaud, Jean, to Deere & Company. Staggered rolls and belts for round baler. 4,399,746, Cl. 100-88.000.

Vibbert, Bruce L.; Billerbeck, Fred W.; and Hoersten, Kenneth P., to Gerber Products Company. Method for producing dried, pureed vegetables. 4,400,402, Cl. 426-471.000.

Victor Company of Japan: *See—*
Watanabe, Yasuaki; and Kaneko, Kenji, 4,400,732, Cl. 358-147.000.

Victor Company of Japan Ltd.: *See—*
Mouri, Tomohiro, 4,400,633, Cl. 307-351.000.
Saito, Takashi; Hirano, Toshio; and Kumaki, Takashi, 4,400,808, Cl. 369-262.000.

Vilmur, Richard J., to Motorola, Inc. Speakerphone for radio and, landline telephones. 4,400,584, Cl. 179-1.0HF.

Virco Mfg. Corporation: *See—*
DeDecker, Edward J., 4,400,031, Cl. 297-239.000.

Vishnevsky, Vladimir S.; Koval, Vitaly S.; Lavrinenko, Vyacheslav V.; Boichenko, Oleg L.; Kartashev, Igor A.; Golovyashin, Jury V.; Serov, Nikolai F.; Shinkarenko, Leonid I.; and Jurash, Oleg G., to Kievsky Politekhnichesky Institut. Piezoelectric motor with two part rotor. 4,400,641, Cl. 310-323.000.

Vivian, John; Cooper, Patrick R.; Higgins, Ronald B.; Harlan, John A.; Perry, Paul M.; Vallhonrat, Juan B.; and Golden, Donald P., Jr., to Litton Resources Systems, Inc. Large-volume, high-speed data processor. 4,400,778, Cl. 364-200.000.

Vock, Manfred H.: *See—*
Pittet, Alan O.; Muralidhara, Ranya; and Vock, Manfred H., 4,400,390, Cl. 424-301.000.

Vogler, William E., Jr.; and Halvorson, Thomas G., to Union Carbide Corporation. Atmospheric vaporizer. 4,399,660, Cl. 62-52.000.

Vogt, Carl L.: *See—*
Holland, Charles R.; and Vogt, Carl L., 4,399,902, Cl. 194-1.00D.

Vogt, Dieter: *See—*
Stache, Bernd; and Vogt, Dieter, 4,400,268, Cl. 209-236.000.

Volfson, Boris, to Graber Industries, Inc. Roll type closure assembly for a window. 4,399,855, Cl. 160-23.00R.

Volprecht, Werner: *See—*
Alter, Eduard; Bruns, Ludwig; and Volprecht, Werner, 4,400,308, Cl. 252-463.000.

von der Crone, Jost, to Ciba-Geigy Corporation. Isoindoline pigments. 4,400,507, Cl. 544-300.000.

von Werner, Konrad; and Gisser, Alfons, to Hoechst Aktiengesellschaft. Process for the preparation of pure, saturated perfluoroalkane-1-carboxylic acids from 1-iodoperfluoroalkanes. 4,400,325, Cl. 260-408.000.

Vormbrock, Rolf; and Helger, Roland, to Merck Patent Gesellschaft mit beschrankter Haftung. Method and agent for the stabilization of alkaline phosphatase. 4,400,464, Cl. 435-21.000.

Voyce, Jason M.: *See—*
Braithwaite, David G.; Cheavens, Thomas; and Voyce, Jason M., 4,400,241, Cl. 203-18.000.

W. C. Heraeus GmbH: *See—*
Wagner, Armin C., 4,400,350, Cl. 420-464.000.

W. H. Brady Co.: *See*—
Frame, Norman J., 4,400,758, Cl. 361-290.000.
W. Schlafhorst & Co.: *See*—
Preuhs, Hans-Jurgen, 4,399,951, Cl. 242-18.0DD.
Wachter, William J.; and Robbins, Thomas R. Storage rack for nuclear fuel assemblies. 4,400,344, Cl. 376-272.000.
Wacker-Chemie GmbH: *See*—
Artes, Reinhold; Frey, Volker; Graf, Werner; and Zeller, Norbert, 4,400,528, Cl. 556-430.000.
Wada, Akira: *See*—
Iwata, Riso; and Wada, Akira, 4,400,486, Cl. 525-57.000.
Wagaman, Kerry L.; and Henderson, Larry D., to United States of America, Navy. Alkenol synthesis. 4,400,562, Cl. 568-903.000.
Wagatsuma, Yuuji; and Naruo, Hideaki, to Tokyo Shibaura Denki Kabushiki Kaisha. Welding electrode pair and method of welding. 4,400,608, Cl. 219-107.000.
Wagner, Armin C., to W. C. Heraeus GmbH. Palladium dental alloy. 4,400,350, Cl. 420-464.000.
Wagner, Franz M., to Allied Corporation. Battery vent. 4,400,450, Cl. 429-86.000.
Wagner, Kuno: *See*—
Haas, Peter; Muller, Heinz; Seifert, Peter; Wagner, Kuno; Findeisen, Kurt; and Konig, Klaus, 4,400,331, Cl. 260-932.000.
Richter, Roland; Muller, Hanns P.; Wagner, Kuno; Helm, Rudolf; and Zander, Jurgen, 4,400,560, Cl. 568-863.000.
Wahl, Klaus; and Purps, Klaus, to Dornier System GmbH. Process and equipment for rendering visible the charge of ion exchangers. 4,400,279, Cl. 210-679.000.
Wahlco, Inc.: *See*—
Coe, E. Lee, Jr., 4,400,662, Cl. 323-320.000.
Wajima, Motoyo: *See*—
Takahashi, Akio; Itoh, Yutaka; Shimazaki, Takeshi; Wajima, Motoyo; Morishita, Hirosada; Mizuno, Yutaka; Yokozawa, Shunya; and Tsukanishi, Kenji, 4,400,438, Cl. 428-458.000.
Wakabayashi, Takayuki: *See*—
Tomita, Yukio; Wakabayashi, Takayuki; Oda, Noriyuki; and Yamamoto, Hirotaka, 4,400,184, Cl. 55-106.000.
Wakou, Susumu; and Kadowaki, Satoshi, to Honda Giken Kogyo Kabushiki Kaisha. Exchanging apparatus for welding jig units of an automatic welding apparatus. 4,400,607, Cl. 219-86.800.
Walford, Thomas L. H.: *See*—
Lacey, Stephen J.; Wardle, Frank P.; Walford, Thomas L. H.; Knight, Samuel H.; Kent, Anthony J.; and Sharman, Kenneth E., 4,400,098, Cl. 384-99.000.
Walker, Ned W. Stress panel repair insert for aircraft. 4,399,965, Cl. 244-129.400.
Walkow, Fred; Czerney, Peter; Hartmann, Horst; and Marx, Jorg, to VEB Filmfabrik Wolfen. Diazonium salts and a diazo-type material comprising these diazonium salts. 4,400,458, Cl. 430-157.000.
Wallace, William K.; Giardino, David A.; and Groshans, Joseph R., to Chicago Pneumatic Tool Company. Microprocessor monitoring system for fastener tightening. 4,400,785, Cl. 364-508.000.
Walter, Lothar: *See*—
Olschewski, Armin; Brandenstein, Manfred; Walter, Lothar; and Kunkel, Heinrich, 4,399,898, Cl. 198-98.000.
Walter, Robert J.: *See*—
Lewis, Jack R.; and Walter, Robert J., 4,400,442, Cl. 428-544.000.
Walters, Sandra J.: *See*—
Lal, Joginder; and Walters, Sandra J., 4,400,488, Cl. 525-211.000.
Wamstad, David B., to Honeywell, Inc. Stress sensitive semiconductor unit and housing means therefor. 4,399,707, Cl. 73-727.000.
Ward, David B., to Rheem Textile Systems, Inc. Garment pressing machine. 4,399,624, Cl. 38-27.000.
Ward, Jeriline: *See*—
Murphy, Paul D.; and Reph, Clinton A., 4,399,645, Cl. 52-743.000.
Wardle, Frank P.: *See*—
Lacey, Stephen J.; Wardle, Frank P.; Walford, Thomas L. H.; Knight, Samuel H.; Kent, Anthony J.; and Sharman, Kenneth E., 4,400,098, Cl. 384-99.000.
Ware, Gordon K., to Chicago Roller Skate Company. Roller skate. 4,400,001, Cl. 280-11.280.
Warfield, Peter F.: *See*—
Gruetzmacher, Robert R.; Munger, Stanley H.; and Warfield, Peter F., 4,400,459, Cl. 430-306.000.
Warnaco Inc.: *See*—
Aldrich, William E., 4,400,426, Cl. 428-290.000.
Wastemate Corp.: *See*—
Spelber, Leonard G.; and Tucker, Abraham I., 4,399,947, Cl. 241-46.00B.
Watanabe, Eiki, to Mitsubishi Denki Kabushiki Kaisha. Thyristor Leonard type elevator control system. 4,399,892, Cl. 187-29.00R.
Watanabe, Katunori: *See*—
Funato, Masayoshi; and Watanabe, Katunori, 4,399,717, Cl. 74-339.000.
Watanabe, Susumu: *See*—
Katsuragi, Shigeo; Morita, Kaoru; Kobari, Sadami; Noda, Toshiharu; Nakagawa, Nobuaki; and Watanabe, Susumu, 4,400,316, Cl. 260-112.50R.
Watanabe, Yasuaki; and Kaneko, Kenji, to Victor Company of Japan. PCM Signal extracting circuit. 4,400,732, Cl. 358-147.000.
Watkins, Hugh: *See*—
Licciardello, Michael; Boden, Richard M.; Watkins, Hugh; and Hanna, Marie R., 4,400,290, Cl. 252-174.110.
Watts, Lewis W., Jr.: *See*—
Darden, Jerome W.; Marquis, Edward T.; and Watts, Lewis W., Jr., 4,400,565, Cl. 585-10.000.
Wawra, Georg: *See*—
Springer, Carl M.; Theis, Bernd O.; Wawra, Georg; and Juffa, Richard, 4,400,147, Cl. 418-206.000.
Weaver, Max A.; and Coates, Clarence A., Jr., to Eastman Kodak Company. Substituted 5-acyl-3-carbamoyl-2-thienyl azo dyes with aniline, tetrahydroquinoline, and benzomorpholine couplers, process of manufacture, and polyamide testile materials dyed therewith. 4,400,318, Cl. 260-152.000.
Weber, Christoph: *See*—
Franke, Konrad; and Weber, Christoph, 4,400,749, Cl. 360-104.000.
Weber, Howard F.: *See*—
Cave, David L.; Maulding, Gary L.; and Weber, Howard F., 4,400,756, Cl. 361-152.000.
Webster, Donald R., to Pacific Scientific Instruments Company. Instrument for grinding and analyzing material in ground state. 4,400,086, Cl. 356-36.000.
Wedertz, Larry D.; Niemeier, Byron M.; and Ross, Oakley G., to General Dynamics, Pomona Division. Wobble nose control for projectiles. 4,399,962, Cl. 244-3.230.
Weiger, Gunter; Schwerdt, Paul; and Ziegenberg, Alfred, to Daimler-Benz Aktiengesellschaft. Acceleration detector. 4,399,705, Cl. 73-654.000.
Weil, Thomas A., to Standard Oil Company (Indiana). Process for 1,4-phenylenediamine. 4,400,537, Cl. 564-402.000.
Weindelmayer, Frederick G., to Outboard Marine Corporation. Device for improving fuel efficiency in internal combustion engine. 4,399,800, Cl. 123-592.000.
Weirich, Friedhelm: *See*—
Henrich, Edmund; Hufner, Reinhold; and Weirich, Friedhelm, 4,400,183, Cl. 55-44.000.
Weiss, Gary R., to Zenith Radio Corporation. Lid raising means for a jack-in-the-box projection television receiver. 4,400,736, Cl. 358-254.000.
Weitz, Lou: *See*—
Murphy, Paul D.; and Reph, Clinton A., 4,399,645, Cl. 52-743.000.
Welding Institute, The: *See*—
Wilkinson, Michael E., 4,400,611, Cl. 219-137.00R.
Welz, Albert W., Jr.: *See*—
Johnston, Reed H.; Jeffreys, Dennis C.; Stratton, Lawrence J.; and Welz, Albert W., Jr., 4,400,688, Cl. 340-310.00R.
Wenner, Jack W.: *See*—
Godsoe, Robert J.; and Wenner, Jack W., 4,399,959, Cl. 242-195.000.
Weon Joong, Sohn. Preventive device of rubber glove against fluid-stain. 4,399,567, Cl. 2-161.00R.
Wessels, John A.; and Chen, Feng I., to Entex Industries, Inc. Single channel radio control system. 4,400,698, Cl. 340-825.720.
Wessendorf, Walter F., Jr.: *See*—
Lee, Morris M., 4,399,840, Cl. 138-168.000.
Western Electric Company, Inc.: *See*—
Hancock, David S.; and Holman, James R., 4,399,602, Cl. 29-426.400.
Moyer, Harold W., 4,399,610, Cl. 29-827.000.
Westinghouse Electric Corp.: *See*—
Locke, Philip F., Jr.; and Maxwell, Albert H., Jr., 4,400,783, Cl. 364-483.000.
Mandel, Alan F.; Eichler, Kenneth M.; and Bauman, Douglas A., 4,400,786, Cl. 364-513.000.
Thomas, Michael W., 4,400,675, Cl. 336-160.000.
Wiley, Roy O., 4,400,603, Cl. 200-153.00G.
Wold, Donald C., 4,399,999, Cl. 277-199.000.
Wetzel, William H.; Pan, Hsi-Lung; Goodwin, Robert J.; and Wilkinson, John E., to Reichhold Chemicals, Incorporated. Catalyst for reducing formation of chlorinated dioxins in manufacture of chlorinated phenols. 4,400,556, Cl. 568-776.000.
Wheatley, Charles, to Barton Valve Company, Inc. Ball valve. 4,399,977, Cl. 251-315.000.
Wheeler, Harry L: *See*—
Prestridge, Floyd L.; Schuetz, Adolph A.; and Wheeler, Harry L, 4,400,253, Cl. 204-186.000.
White, John F.: *See*—
Nemet-Mavrodin, Margaret I.; and White, John F., 4,400,558, Cl. 568-810.000.
Whitehead, Edgar D. Penile prosthetic device. 4,399,812, Cl. 128-79.000.
Whitehurst, Darrell D.: *See*—
Mitchell, Thomas O.; and Whitehurst, Darrell D., 4,400,561, Cl. 568-902.000.
Whitfield, Richard G.: *See*—
Cooke, Theodore M.; Lin, Robert A.; Whitfield, Richard G.; and Hock, Allan G., 4,400,215, Cl. 106-22.000.
Whitinger, Robert J., to Texas Instruments Incorporated. Arbitrary drive for magnetic field waveform control. 4,400,809, Cl. 371-27.000.
Whittam, Thomas V.: *See*—
Lake, Ivan J. S.; and Whittam, Thomas V., 4,400,572, Cl. 585-481.000.
Whitworth, Charles R.: *See*—
Henslee, Walter W.; Lindsey, John S.; Morrow, Stanley J.; Periard, John N.; and Whitworth, Charles R., 4,400,431, Cl. 428-402.000.
Wick, Arnold: *See*—
Hari, Stefan; and Wick, Arnold, 4,400,319, Cl. 260-155.000.
Wiedenmann, Hans-Martin: *See*—
Stahl, Roland; and Wiedenmann, Hans-Martin, 4,400,260, Cl. 204-426.000.

Wiedmann, Paul R., to Bank Building & Equipment Corporation of America. Structure for automatic teller machine. 4,399,755, Cl. 109-2.000.
Wierenga, Wendell, to Upjohn Company, The. Composition of matter and process. 4,400,518, Cl. 548-433.000.
Wigelsworth, Bobby R.: *See*—
Pyle, Clayton C.; and Wigelsworth, Bobby R., 4,399,577, Cl. 15-49.00C.
Wiknich, Douglas D.; and Peabody, Michael J., to LaSalle Machine Tool, Inc. Accumulating conveyor. 4,399,907, Cl. 198-718.000.
Wildbolz, Rudolf, to Rieter Machine Works Ltd. Method and apparatus for checking a blending plant for textile staple fibres. 4,399,590, Cl. 19-145.500.
Wiley, Roy O., to Westinghouse Electric Corp. Electrical switch for alternating current. 4,400,603, Cl. 200-153.00G.
Wilgood Corporation: *See*—
Feller, Murray F., 4,399,696, Cl. 73-195.000.
Wilhelm Hegenscheidt Gesellschaft mgH: *See*—
Dombrowski, Theodor, 4,399,724, Cl. 82-8.000.
Wilkins, Cletus W., Jr.: *See*—
Chandross, Edwin A.; Reichmanis, Elsa; and Wilkins, Cletus W., Jr., 4,400,461, Cl. 430-311.000.
Wilkinson, John E.: *See*—
Wetzel, William H.; Pan, Hsi-Lung; Goodwin, Robert J.; and Wilkinson, John E., 4,400,556, Cl. 568-776.000.
Wilkinson, Michael E., to Welding Institute, The. Welding at pressures greater than atmospheric pressure. 4,400,611, Cl. 219-137.00R.
Willamette Industries, Inc.: *See*—
Milligan, Timothy H., 4,400,128, Cl. 414-417.000.
Williams, Dylan F.: *See*—
Cho, Frederick Y.; and Williams, Dylan F., 4,400,640, Cl. 310-313.00A.
Williams, Ian G.: *See*—
Candlin, John P.; Caunt, Anthony D.; and Williams, Ian G., 4,400,301, Cl. 252-429.00B.
Williams, Richard A.: *See*—
Shiurila, John; and Williams, Richard A., 4,400,102, Cl. 400-124.000.
Williamson, Alma J. Individual beverage cooler. 4,399,668, Cl. 62-457.000.
Willis, Brian J.; Eilerman, Robert G.; and Yurecko, John M., Jr., to Fritzsche Dodge & Olcott Inc. Alicyclic ketone and alcohol derivatives. 4,400,545, Cl. 568-377.000.
Wilpon, Jay G.: *See*—
Pirz, Frank C.; Rabiner, Lawrence R.; and Wilpon, Jay G., 4,400,828, Cl. 382-30.000.
Wilson, Keith B.: *See*—
Patel, Suresh U.; Cormier, Thomas E.; and Wilson, Keith B., 4,400,188, Cl. 62-13.000.
Winters, John R.: *See*—
Gibson, Charles A.; and Winters, John R., 4,400,539, Cl. 564-480.000.
Wirtzfeld, Alexander; Heinze, Roland; Bock, Thomas; and Liess, Hans D. Process and device for regulating the stimulation frequency of heart pacemakers. 4,399,820, Cl. 128-419.0PG.
Wisconsin Alumni Research Foundation: *See*—
Zeikus, Joseph G.; Ng, Thomas K.; Ben-Bassat, Arie; and Lamed, Raphael J., 4,400,470, Cl. 435-162.000.
Witte, Paul A.: *See*—
Buechel, Frederick F.; Pappas, Michael J.; and Witte, Paul A., 4,400,168, Cl. 604-48.000.
Woditsch, Peter: *See*—
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Woelke Magnetbandtechnik GmbH & Co. KG: *See*—
Franke, Konrad; and Weber, Christoph, 4,400,749, Cl. 360-104.000.
Wolcott, Herbert B., to Atlantic Richfield Company. Method for injecting a gaseous stream into a hot subterranean zone. 4,399,867, Cl. 166-261.000.
Wold, Donald C., to Westinghouse Electric Corp. Segmented annular seal for missle launch tube. 4,399,999, Cl. 277-199.000.
Wolf, Robert: *See*—
Schiel, Christian; and Wolf, Robert, 4,399,747, Cl. 100-162.00B.
Wolff Walsrode Aktiengesellschaft: *See*—
Rosenthal, Heinrich; Schinkel, Ingo; Eger, Gunter; and Bair, Wolfgang, 4,400,428, Cl. 428-349.000.
Wong, Raphael W. H.; Ryason, Robert R.; and Rahm, Charles L. Microprocessor base for monitor/control of communications facilities. 4,400,694, Cl. 340-505.000.
Wong, Rayman Y.; and Bunker, Nathan S., to Stauffer Chemical Company. Method for preparation of N-phosphonomethylglycine. 4,400,330, Cl. 260-502.50F.
Wood, Douglas E.: *See*—
Yeager, Thomas C.; Wood, Douglas E.; and Kooy, Wayne J., 4,400,105, Cl. 400-616.100.
Wood, Ernest, deceased: *See*—
Samuels, Peter B.; Wood, Ernest, deceased; and Lee, George S., 4,399,810, Cl. 128-337.000.
Woodling, Richard S.: *See*—
Jennings, Daniel E.; and Woodling, Richard S., 4,400,591, Cl. 179-156.00R.
Woodward, Stewart A.: *See*—
Morris, George E.; and Woodward, Stewart A., 4,400,628, Cl. 307-118.000.
Wootton, Gerald V.: *See*—
Lane, Parley C., Jr.; Tenney, Linwood P.; and Wootton, Gerald V., 4,400,501, Cl. 528-496.000.
Worden, Donald A.: *See*—
de Versterre, William I.; and Worden, Donald A., 4,399,836, Cl. 137-487.500.
Wordex: *See*—
Daughters, James R., 4,400,103, Cl. 400-208.000.
Wortel, Theodorus M.; and Schutten, Jan H., to Exxon Research & Engineering Co. Oxidative coupling of aromatic methyl groups. 4,400,567, Cl. 585-428.000.
Wright, Fred, to Simmonds Precision Products, Inc. Tube connector. 4,400,022, Cl. 285-256.000.
Wright, Joe W.: *See*—
McConaughy, Robert C.; and Wright, Joe W., 4,399,872, Cl. 166-341.000.
Wunderlich, Klaus: *See*—
Harms, Wolfgang; and Wunderlich, Klaus, 4,400,504, Cl. 544-76.000.
Wyslotsky, Ihor, to Labless, Israel. Label indexing and applicator apparatus. 4,400,230, Cl. 156-361.000.
Xerox Corporation: *See*—
Anderson, David G.; Bigenwald, John J.; and Fantuzzo, Joseph, 4,399,933, Cl. 222-407.000.
Tomory, Ronald S.; and Odorczyk, James M., 4,400,738, Cl. 358-283.000.
Traino, James C.; Micco, Felice A.; and Keene, Douglas L., 4,400,740, Cl. 358-293.000.
Yamada, Shigeo: *See*—
Itoh, Testuro; Oizumi, Toshiro; and Yamada, Shigeo, 4,400,606, Cl. 219-69.00M.
Yamagata, Ryutaro: *See*—
Kozuka, Nobuhiko; Yamagata, Ryutaro; Koyama, Shigeo; Sakata, Hiromi; and Kano, Atsushi, 4,400,077, Cl. 355-3.0DR.
Yamaha Hatsudoki Kabushiki Kaisha: *See*—
Iwai, Tomio, 4,399,797, Cl. 123-552.000.
Yamakage, Tetsuro; Yoneda, Takao; and Imamura, Kohsei, to Toyoda Koki Kabushiki Kaisha. Machine tool with bore diameter measuring apparatus and tool position compensating apparatus. 4,400,118, Cl. 408-3.000.
Yamamitsu, Chojuro; Arimura, Ichiro; and Ohtsu, Masamitsu, to Matsushita Electric Industrial Co., Ltd. Magnetic recording and reproducing apparatus for color video signals. 4,400,742, Cl. 358-318.000.
Yamamitsu, Chojuro: *See*—
Sekimoto, Kunio; Yamamoto, Katsuhiko; Yamamitsu, Chojuro; and Kurashina, Kozo, 4,400,741, Cl. 358-312.000.
Yamamoto, Hirotaka: *See*—
Tomita, Yukio; Wakabayashi, Takayuki; Oda, Noriyuki; and Yamamoto, Hirotaka, 4,400,184, Cl. 55-106.000.
Yamamoto, Katsuhiko: *See*—
Sekimoto, Kunio; Yamamoto, Katsuhiko; Yamamitsu, Chojuro; and Kurashina, Kozo, 4,400,741, Cl. 358-312.000.
Yamamoto, Katsumi: *See*—
Hotta, Shigeo; and Yamamoto, Katsumi, 4,400,781, Cl. 364-474.000.
Yamanouchi, Shosuke; and Kojima, Keiichi, to Sumitomo Electric Industries, Ltd. Process for producing crosslinked polyethylene insulated cable. 4,400,580, Cl. 174-102.0SC.
Yamashita, Kiyoshi: *See*—
Shimoda, Eitaro; and Yamashita, Kiyoshi, 4,400,687, Cl. 338-184.000.
Yamashita, Tadashi; and Okamoto, Toyoo, to Ricoh Company, Ltd. Apparatus for cleaning photosensitive member of electrostatic copying machine. 4,400,081, Cl. 355-15.000.
Yamauchi, Kazuo: *See*—
Nagao, Syuji; Nakai, Ryoichi; and Yamauchi, Kazuo, 4,400,780, Cl. 364-449.000.
Yang, Kuo S., to Eli Lilly and Company. Purification of syn-7-[[(2-amino-4-thiazolyl)(methoxyimino) acetyl]amino]-3-methyl-3-cephem-4-carboxylic acid. 4,400,503, Cl. 544-28.000.
Yang, Wei-Yeih W., to B.F. Goodrich Company, The. Nylon compositions and RIM process for making same. 4,400,490, Cl. 525-423.000.
Yano, Tsuneomi, to Nissan Motor Company, Limited. Warm up control system for an internal combustion engine. 4,399,789, Cl. 123-340.000.
Yaotani, Kouichi; Yoshida, Minoru; and Arisaka, Oomi, to Nissan Motor Company, Limited. Snap-on plug. 4,399,927, Cl. 220-307.000.
Yasuda, Koichi: *See*—
Suda, Takayuki; and Yasuda, Koichi, 4,400,674, Cl. 336-65.000.
Yates, Herbert, to MYL Developments Ltd. Cable jumper without polarity. 4,400,658, Cl. 320-26.000.
Yeager, Thomas C.; Wood, Douglas E.; and Kooy, Wayne J., to Printck, Inc. Computer printer paper tractor mounting means. 4,400,105, Cl. 400-616.100.
Ying, David H. S.: *See*—
Givens, Edwin N.; and Ying, David H. S., 4,400,261, Cl. 208-8.0LE.
Yoda, Kuniichi; Ohkawa, Takehisa; and Azegami, Hitoshi, to TDK Electronics Co., Ltd. Magnetic recording medium. 4,400,435, Cl. 428-425.900.
Yokoyama, Shigeo; Misumi, Teruyuki; Fujimoto, Einosuke; and Kobayashi, Yutaka, to Asahi Kasei Kabashiki Kaisha. Thiolcarbamate compounds and their use as herbicides. 4,400,199, Cl. 71-88.000.
Yokozawa, Shunya: *See*—
Takahashi, Akio; Itoh, Yutaka; Shimazaki, Takeshi; Wajima, Motoyo; Morishita, Hirosada; Mizuno, Yutaka; Yokozawa, Shunya; and Tsukanishi, Kenji, 4,400,438, Cl. 428-458.000.

Yokura, Miyoshi: *See*—
Hatada, Kenji; Yokura, Miyoshi; and Kobayashi, Hiroaki, 4,400,424, Cl. 428-212.000.

Yoneda, Takao: *See*—
Yamakage, Tetsuro; Yoneda, Takao; and Imamura, Kohsei, 4,400,118, Cl. 408-3.000.

Yonekura, Yasuhiro, to Dainippon Screen Seizo Kabushiki Kaisha. Correction circuit of a halftone dot area rate detector. 4,400,617, Cl. 250-214.00A.

Yoon, Jason: *See*—
Yoon, John; and Yoon, Jason, 4,399,595, Cl. 24-201.00B.

Yoon, John; and Yoon, Jason. Magnetic closure mechanism. 4,399,595, Cl. 24-201.00B.

Yoshida Industry Co., Ltd.: *See*—
Ogasawara, Hirotake, 4,399,826, Cl. 132-83.00R.

Yoshida, Minoru: *See*—
Yaotani, Kouichi; Yoshida, Minoru; and Arisaka, Oomi, 4,399,927, Cl. 220-307.000.

Yoshida, Mitsuhiro: *See*—
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Yoshida, Toshio: *See*—
Akiyama, Kazuhiko; Yoshino, Takeshi; Shiina, Michihiro; Sato, Shigeo; Nishizawa, Tetsuo; Yoshida, Toshio; and Kobayashi, Nobuo, 4,400,074, Cl. 354-173.000.

Yoshikawa, Kunihiko: *See*—
Kudo, Takeo; Okada, Yasutaka; Moroishi, Taishi; Ikeda, Akio; Ohtani, Hiroo; and Yoshikawa, Kunihiko, 4,400,209, Cl. 420-443.000.
Kudo, Takeo; Okada, Yasutaka; Moroishi, Taishi; Ikeda, Akio; Ohtani, Hiroo; and Yoshikawa, Kunihiko, 4,400,210, Cl. 420-443.000.
Kudo, Takeo; Okada, Yasutaka; Moroishi, Taishi; Ikeda, Akio; Ohtani, Hiroo; and Yoshikawa, Kunihiko, 4,400,211, Cl. 420-443.000.
Kudo, Takeo; Okada, Yasutaka; Moroishi, Taishi; Ikeda, Akio; Ohtani, Hiroo; and Yoshikawa, Kunihiko, 4,400,349, Cl. 420-443.000.

Yoshikawa, Ryoichi: *See*—
Tosaka, Yoichi; Uchidoi, Masanori; Shigeta, Yoshihiro; Yoshikawa, Ryoichi; and Haraguchi, Shosuke, 4,400,073, Cl. 354-173.000.

Yoshimoto, Akio: *See*—
Tanaka, Takayuki; Kadoi, Noriaki; and Yoshimoto, Akio, 4,399,775, Cl. 123-41.080.

Yoshino, Takeshi: *See*—
Akiyama, Kazuhiko; Yoshino, Takeshi; Shiina, Michihiro; Sato, Shigeo; Nishizawa, Tetsuo; Yoshida, Toshio; and Kobayashi, Nobuo, 4,400,074, Cl. 354-173.000.

Yoshioka, Susumu, to Mitutoyo Mfg. Co., Ltd. Height gage. 4,399,617, Cl. 33-169.00R.

Yoshiya, Hiroki: *See*—
Omori, Shunji; Hayashi, Kanji; Hiasa, Yukio; Maeda, Nobutaka; Hashimoto, Shoichi; and Yoshiya, Hiroki, 4,399,727, Cl. 83-345.000.

Yoshiyuki, Hidetoshi, to Takara Company. Modular cabinet system. 4,400,044, Cl. 312-204.000.

Yoshizumi, Tsuneto: *See*—
Takemura, Shuji; Hirakawa, Kazumi; and Yoshizumi, Tsuneto, 4,400,706, Cl. 346-135.100.

Yost, Thomas D., to RCA Corporation. Synchronizing pulse separator. 4,400,733, Cl. 358-155.000.

Young, David A.: *See*—
Lagace, Linda S.; Miller, Richard C.; and Young, David A., 4,400,299, Cl. 252-413.000.

Youngberg, Charles L.; Miller, Charles G., deceased; Stephens, James B.; and Finnerty, Anthony A., to United States of America, National Aeronautics and Space Administration. Sphere forming method and apparatus. 4,400,191, Cl. 65-21.400.

Yuan, Han-Tzong; and Anderson, Roger N., to United States of America, Air Force. Technique of silicon epitaxial refill. 4,400,411, Cl. 427-86.000.

Yurecko, John M., Jr.: *See*—
Willis, Brian J.; Eilerman, Robert G.; and Yurecko, John M., Jr., 4,400,545, Cl. 568-377.000.

Yuyama, Masahiro: *See*—
Hanamura, Yoshimi; Yuyama, Masahiro; and Sakuramoto, Akira, 4,400,236, Cl. 159-2.00E.

Zacuto, Victor. Cutting device. 4,399,726, Cl. 83-411.00R.

Zadorozhny, Jury G.: *See*—
Mamadzhanov, Ulmas D.; Bakhir, Vitold M.; Klimenko, Vladimir I.; Alekhin, Stanislav A.; and Zadorozhny, Jury G., 4,400,266, Cl. 209-130.000.

Zahnradfabrik Friedrichshafen AG: *See*—
Dziuba, Peter; and Simon, Herbert, 4,399,715, Cl. 74-15.660.

Zaidan Hojin Handotai Kenkyu Shinkokai: *See*—
Nishizawa, Jun-ichi; Ohmi, Tadahiro; and Takahashi, Keishiro, 4,400,710, Cl. 357-15.000.

Zander, Jurgen: *See*—
Richter, Roland; Muller, Hanns P.; Wagner, Kuno; Helm, Rudolf; and Zander, Jurgen, 4,400,560, Cl. 568-863.000.

Zboralski, Jon A., to Hamilton Industries, Inc. Fume hood with dual room air inlet systems. 4,399,740, Cl. 98-115.0LH.

Zboralski, Jon A., to Hamilton Industries, Inc. Method of controlling room air flow into a fume hood. 4,399,741, Cl. 98-115.0LH.

Zeikus, Joseph G.; Ng, Thomas K.; Ben-Bassat, Arie; and Lamed, Raphael J., to Wisconsin Alumni Research Foundation. Use of cocultures in the production of ethanol by the fermentation of biomass. 4,400,470, Cl. 435-162.000.

Zeiringer, Rudolf: *See*—
List, Helmut; Claassen, Peter; and Zeiringer, Rudolf, 4,399,706, Cl. 73-708.000.

Zeller, Norbert: *See*—
Artes, Reinhold; Frey, Volker; Graf, Werner; and Zeller, Norbert, 4,400,528, Cl. 556-430.000.

Zenith Radio Corporation: *See*—
Fanizza, Michael A.; and Schmid, Richard G., 4,400,723, Cl. 358-60.000.
Strammello, Peter, Jr., 4,400,735, Cl. 358-181.000.
Weiss, Gary R., 4,400,736, Cl. 358-254.000.

Zetler, Gerhard; Rossi, Alessandro; and De Paolis, Chiara, to Farmitalia Carlo Erba, S.p.A. Use of polypeptides as analgesic drugs. 4,400,377, Cl. 424-177.000.

Ziegenberg, Alfred: *See*—
Weiger, Gunter; Schwerdt, Paul; and Ziegenberg, Alfred, 4,399,705, Cl. 73-654.000.

Zimmer, Ernst, to Kuka Schweissanlagen & Roboter GmbH. Pivot drive for manipulator. 4,399,718, Cl. 74-409.000.

Zimmermann, Guenter. Volumetric metering valve. 4,399,932, Cl. 222-380.000.

Zimmermann, Josef: *See*—
Dettbarn, Hans-Jurgen; and Zimmermann, Josef, 4,400,171, Cl. 604-68.000.
Dettbarn, Hans-Jurgen; and Zimmermann, Josef, 4,400,172, Cl. 604-70.000.

Zola, Meyer J., to Bell Telephone Laboratories, Incorporated. Telephone switching network. 4,400,627, Cl. 307-115.000.

Zrinscak, Fred S., to Mobil Oil Corporation. Process for the reduction of the effect of contaminant metals in cracking catalysts. 4,400,307, Cl. 252-455.00Z.

ZVS Adamovske strojirny, Koncernovy podnik: *See*—
Jiruse, Jaroslav, 4,399,990, Cl. 271-90.000.

Zylbert, Thaddeus J.: *See*—
Creed, Gerald J.; and Zylbert, Thaddeus J., 4,399,761, Cl. 112-242.000.

37: *See*—
Haacke, Wigo; Adrian, Gerhard; Gawol, Manfred; Henbach, Rainer; and 37, 4,400,365, Cl. 423-306.000.

LIST OF REISSUE PATENTEES

TO WHOM

PATENTS WERE ISSUED ON THE 23RD DAY OF AUGUST, 1983

NOTE.—Arranged in accordance with the first significant character or word of the name (in accordance with city and telephone directory practice).

Cha, Charles L.; Denlinger, George W.; Pipkorn, David N.; and Spyrou, Elias, to Mead Corporation, The. Jet drop printer with elements balanced about support plate in nodal plane. Re. 31,358, Cl. 346-75.000.

Cheung, Nelson, to Signode Corporation. Expanding strap loop forming and friction fusion machine. Re. 31,353, Cl. 100-4.000.

Cone, Donald R., to Mead Corporation, The. Glass nozzle array for an ink jet printer and method of forming same. Re. 31,357, Cl. 346-75.000.

Denlinger, George W.: *See*—
Cha, Charles L.; Denlinger, George W.; Pipkorn, David N.; and Spyrou, Elias, Re. 31,358, Cl. 346-75.000.

Dow Chemical Co., The: *See*—
Habermann, Clarence E.; and Tefertiller, Ben A., Re. 31,356, Cl. 564-127.000.

Eckner, Gunter, to Hoechst Aktiengesellschaft. Process for coating metal tubes and use of the coated tubes. Re. 31,354, Cl. 138-131.000.

Fath, Dean W.: *See*—
Kueser, John J.; and Fath, Dean W., Re. 31,352, Cl. 99-283.000.

Habermann, Clarence E.; and Tefertiller, Ben A., to Dow Chemical Co., The. Hydration of nitriles to amides using cupreous catalysts. Re. 31,356, Cl. 564-127.000.

Hoechst Aktiengesellschaft: *See*—
Eckner, Gunter, Re. 31,354, Cl. 138-131.000.

Kelsey-Hayes Company: *See*—
Rozmus, Walter J., Re. 31,355, Cl. 419-49.000.

Kueser, John J.; and Fath, Dean W., to UMC Industries, Inc. Coffee vendor. Re. 31,352, Cl. 99-283.000.

Mead Corporation, The: *See*—
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Freimuth, Lothar W., 270,246, Cl. D13-30.000.
University Testing Service Inc.: *See*—
Andersen, Harold W.; Harrison, Charles H.; and Worth, Melvin H., Jr., 270,281, Cl. D24-53.000.
Vilval, Juri. Dispensing container for fluid material. 270,238, 8-23-83, Cl. D9-353.000.
Ward, Randall L.: *See*—
Robertson, Stephen H.; and Ward, Randall L., 270,218, Cl. D6-168.000.
Warren Tool Corporation: *See*—
Kusner, John D., 270,216, Cl. D6-85.000.
Westbury Foundation, The: *See*—
Cervantes, Rafael T., 270,295, Cl. D27-51.000.
Wetzel, Timothy D.: *See*—
Tennant, Robert P.; and Wetzel, Timothy D., 270,250, Cl. D14-111.000.
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Stout, Daniel M., 270,267, Cl. D22-19.000.
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Wiseheart, Ronald W.: *See*—
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Worth, Melvin H., Jr.: *See*—
Andersen, Harold W.; Harrison, Charles H.; and Worth, Melvin H., Jr., 270,281, Cl. D24-53.000.
Yamamoto, Sachio: *See*—
Ayukawa, Isao; Yamamoto, Sachio; and Tsukada, Akira, 270,298, Cl. D32-21.000.
Yonezawa Toys Co., Ltd.: *See*—
Iwaya, Hirokatsu; and Kaneko, Hiroshi, 270,258, Cl. D21-31.000.
Zeidman, Gordon G., to Eastern Company, The. Tool and operator head for tool-operated lock. 270,229, 8-23-83, Cl. D8-331.000.

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CLASSIFICATION OF PATENTS

ISSUED AUGUST 23, 1983

NOTE.—First number, class; second number, subclass; third number, patent number

CLASS 2

161 R 4,399,567
322 4,399,568

CLASS 4

555 4,399,569
561 4,399,570

CLASS 5

13 4,399,571
81 R 4,399,572
239 4,399,573
417 4,399,574
450 4,399,575
451 4,399,576

CLASS 8

107 4,400,173
456 4,400,174

CLASS 15

49 C 4,399,577
97 R 4,399,578
104 A 4,399,579
107 4,399,580
176 4,399,581
4,399,582
235.8 4,399,583
243 4,399,584
319 4,399,585

CLASS 16

31 R 4,399,586
35 D 4,399,587

CLASS 17

64 4,399,588

CLASS 19

0.6 4,399,589
145.5 4,399,590
202 4,399,591

CLASS 23

295 R 4,400,175

CLASS 24

25 4,399,592
4,399,593
201 A 4,399,594
201 B 4,399,595

CLASS 27

4 4,399,596

CLASS 28

250 4,399,597

CLASS 29

115 4,399,598
241 4,399,599
401.1 4,399,600
407 4,399,601
426.4 4,399,602
568 4,399,603
4,399,604
571 4,399,605
602 R 4,399,606
623.5 4,399,607
747 4,399,608
4,399,609
827 4,399,610

CLASS 30

350 4,399,611

CLASS 33

20 R 4,399,612
143 M 4,399,613
149 R 4,399,614
161 4,399,616
169 R 4,399,617
361 4,399,615

CLASS 34

10 4,399,618
148 4,399,619

CLASS 36

30 R 4,399,620
32 R 4,399,621

CLASS 37

57 4,399,622
73 4,399,623

CLASS 38

27 4,399,624

CLASS 40

155 4,399,625
530 4,399,626

CLASS 42

1 BC 4,399,627
42 R 4,399,628

CLASS 43

4 4,399,629
17 4,399,630
4,399,631

CLASS 44

1 R 4,400,176
51 4,400,177
72 4,400,178

CLASS 46

16 4,399,632

CLASS 47

57.6 4,399,633
59 4,399,634

CLASS 48

86 R 4,400,179
197 R 4,400,180
4,400,181
214 A 4,400,182

CLASS 49

57 4,399,635
469 4,399,636

CLASS 51

138 4,399,637
170 R 4,399,638
238 S 4,399,639

CLASS 52

202 4,399,640
309.1 4,399,641
483 4,399,642
530 4,399,643
716 4,399,644
743 4,399,645

CLASS 54

49 4,399,646

CLASS 55

44 4,400,183
106 4,400,184
257 C 4,400,185
379 4,400,186
387 4,400,187

CLASS 56

202 4,399,647

CLASS 57

115 4,399,649
265 4,399,648
401 4,399,650

CLASS 60

39.02 4,399,651
39.465 4,399,652
327 4,399,653
395 4,399,654
637 4,399,655
659 4,399,656
664 4,399,657

CLASS 62

13 4,400,188
52 4,399,658
4,399,659
4,399,660
65 4,399,661
82 4,399,662
193 4,399,663
238.7 4,399,664
239 4,399,665
265 4,399,666
382 4,399,667
457 4,399,668
469 4,399,669
538 4,400,189

CLASS 65

13 4,400,190
21.4 4,400,191
29 4,400,192
114 4,400,193
4,400,194

CLASS 66

84 A 4,399,670
196 4,399,671

CLASS 70

101 4,399,672
276 4,399,673
364 A 4,399,674

CLASS 71

10 4,400,195
86 4,400,196
88 4,400,197
4,400,198
4,400,199
4,400,200
92 4,400,201
94 4,400,202
100 4,400,203
4,400,204
105 4,400,205

CLASS 72

37 4,399,675
40 4,399,676
4,399,677
88 4,399,678
117 4,399,679
225 4,399,680
342 4,399,681
359 4,399,682
458 4,399,683

CLASS 73

1 G 4,399,684
11 4,399,685
23 4,399,686
4,399,687
23.1 4,399,688
24 4,399,689
40.7 4,399,690
63 4,399,691
151 4,399,692
152 4,399,693
178 R 4,399,694
185 4,399,695
195 4,399,696
204 4,399,697
4,399,698
304 C 4,399,699
517 B 4,399,700
579 4,399,701
597 4,399,702
621 4,399,703
642 4,399,704
654 4,399,705
708 4,399,706
727 4,399,707
861.61 4,399,708
861.77 4,399,709
863.83 4,399,710
864.16 4,399,711
4,399,712
864.54 4,399,713

CLASS 74

5.1 4,399,714
15.66 4,399,715
125.5 4,399,716
339 4,399,717
409 4,399,718
410 4,399,719

CLASS 75

41 4,400,206
129 4,400,207
4,400,208
170 B1 4,200,459
238 4,400,213
251 4,400,212

CLASS 81

3.37 4,399,720
57.46 4,399,721
60 4,399,722
437 4,399,723

CLASS 82

8 4,399,724

CLASS 83

17 4,399,725
345 4,399,727
411 R 4,399,726
418 4,399,728
455 4,399,729
579 4,399,730

CLASS 84

1.03 4,399,731
454 4,399,732

CLASS 89

1.5 B 4,399,733

CLASS 91

1 4,399,734
369 B 4,399,735
469 4,399,736

CLASS 98

6 4,399,737
32 4,399,738
41 R 4,399,739
115 LH 4,399,740
4,399,741
115 SB 4,399,742
122 4,399,743

CLASS 99

283 Re.31,352
323.1 4,399,744

CLASS 100

2 4,399,745
4 Re.31,353
88 4,399,746
162 B 4,399,747

CLASS 101

93.04 4,399,748
211 4,399,749
245 4,399,750
348 4,399,751

CLASS 102

217 4,399,752

CLASS 104

7 B 4,399,753

CLASS 106

1.13 4,400,214
22 4,400,215
23 4,400,216
93 4,400,217

CLASS 108

159 4,399,754

CLASS 109

2 4,399,755

CLASS 110

346 4,399,756

CLASS 111

34 4,399,757

CLASS 112

79 R 4,399,758
158 E 4,399,759
4,399,760
242 4,399,761
259 4,399,762
262.3 4,399,763

CLASS 114

219 4,399,764
256 4,399,765

CLASS 116

31 4,399,766

CLASS 118

46 4,399,767
423 4,399,768

CLASS 119

3 4,399,769
4,399,770
19 4,399,771
51.5 4,399,772

CLASS 122

390 4,399,773

CLASS 123

41.08 4,399,775
4,399,776
41.1 4,399,774
55 R 4,399,777
65 VB 4,399,778
146.5 A 4,399,779
4,399,780
179 H 4,399,781
179 SE 4,399,782
193 CH 4,399,783
198 DB 4,399,785
198 F 4,399,784
301 4,399,786
321 4,399,787
323 4,399,788
340 4,399,789
440 4,399,790
489 4,399,791
4,399,792
502 4,399,793
523 4,399,794
527 4,399,795
549 4,399,796
552 4,399,797
571 4,399,798
4,399,799
592 4,399,800
603 4,399,801
609 4,399,802

CLASS 124

1 4,399,803

CLASS 126

77 4,399,804
121 4,399,805
143 4,399,806
418 4,399,807
420 4,399,808

CLASS 127

1 4,400,218
23 4,400,219

CLASS 128

1 R 4,399,809
79 4,399,811
4,399,812
92 C 4,399,814
92 EC 4,399,813
153 4,399,815
154 4,399,816
337 4,399,810
419 P 4,399,819
419 PG 4,399,818
4,399,820
630 4,399,821
660 4,399,822
736 4,399,823
4,399,824

CLASS 130

27 S 4,399,825

CLASS 132

83 R 4,399,826
112 4,399,827

CLASS 134

18 4,400,220
65 4,399,828

CLASS 136

259 4,400,577

CLASS 137

15 4,399,829
68 R 4,399,830
154 4,399,831
216 4,399,832
315 4,399,833
375 4,399,834
414 4,399,835
487.5 4,399,836
614.11 4,399,837
625.29 4,399,838

CLASS 138

118.1 4,399,839
131 Re.31,354
168 4,399,840

CLASS 139

383 R 4,399,841

CLASS 140

92.1 4,399,842
92.2 4,399,843
106 4,399,844

CLASS 141

1 4,399,845
192 4,399,846
364 4,399,847

CLASS 144

34 E 4,399,848
364 4,399,849

CLASS 148

1.5 4,400,221
6.11 4,400,222
12 F 4,400,223
15 4,400,224
36 4,400,225

CLASS 150

0.5 4,399,850

CLASS 152

156 4,399,851
353 R 4,399,852
359 4,399,853
367 4,399,854

CLASS 156

56 4,400,226
73.1 4,400,227
144 4,400,228
307.5 4,400,229
361 4,400,230
527 4,400,231
601 4,400,232
626 4,400,233
634 4,400,234
643 4,400,235

CLASS 159

2 E 4,400,236

CLASS 160

23 R 4,399,855
39 4,399,856
323 R 4,399,857

CLASS 162

76 4,400,237
273 4,400,238

CLASS 164

16 4,399,858
342 4,399,859
423 4,399,860
453 4,399,861

CLASS 165

2 4,399,862
9 4,399,863
20 4,399,864

CLASS 166

191 4,399,865
245 4,399,866
261 4,399,867
300 4,399,868
311 4,399,869
324 4,399,870
325 4,399,871
341 4,399,872
380 4,399,873

CLASS 172

269 4,399,874
311 4,399,875

CLASS 173

147 4,399,876

CLASS 174

14 R 4,400,578
102 SC 4,400,580
854 R 4,400,579

CLASS 175

45 4,399,877
227 4,399,878
372 4,399,879

CLASS 177

1 4,399,880
137 4,399,881

CLASS 179

1 D 4,400,583
1 HF 4,400,581
4,400,584
1 SM 4,400,582
2 EB 4,400,585
6.11 4,400,586
27 D 4,400,587
81 R 4,400,588
4,400,589
107 FD 4,400,590
156 R 4,400,591

CLASS 180

6.48 4,399,882
65 E 4,399,883
79.1 4,399,884
125 4,399,885
197 4,399,886
282 4,399,887
315 4,399,888

CLASS 182

6 4,399,889
100 4,399,890
150 4,399,891

CLASS 187

29 R 4,399,892

CLASS 188

32 4,399,893
71.9 4,399,894

CLASS 191

34 4,400,592

CLASS 192

3.29 4,399,895
13 R 4,399,896
89 B 4,399,897
98 4,399,899
106 F 4,399,900
111 A 4,399,901

CLASS 194

1 D 4,399,902
1 F 4,399,903

CLASS 196

132 4,400,239

CLASS 198

98 4,399,898
365 4,399,904
422 4,399,905
662 4,399,906
718 4,399,907
789 4,399,908
852 4,399,909

CLASS 200

5 A 4,400,593
4,400,594
4,400,595
4,400,596
6 B 4,400,597
16 D 4,400,598
50 C 4,400,599
52 R 4,400,600
81.4 4,400,601
82 C 4,400,602
153 G 4,400,603

CLASS 202

248 4,400,240

CLASS 203

18 4,400,241

CLASS 204

1 T 4,400,242
4,400,243
2.1 4,400,244
5 4,400,245
58 4,400,246
59 M 4,400,247
146 4,400,248
158 R 4,400,249
180 R 4,400,250
181 R 4,400,251
4,400,252
186 4,400,253
192 E 4,400,257
192 P 4,400,254
192 S 4,400,256
192 SP 4,400,255
196 4,400,259
415 4,400,258
426 4,400,260

CLASS 206

0.82 4,399,910
219 4,399,911
387 4,399,912
4,399,913
533 4,399,914
586 4,399,915

CLASS 208

8 LE 4,400,261
8 R 4,400,262
10 4,400,263
68 4,400,264
97 4,400,265

CLASS 209

130 4,400,266
211 4,400,267
236 4,400,268
447 4,400,269
559 4,399,916

CLASS 210

103 4,400,270
136 4,400,271
166 4,400,272
284 4,400,273
302 4,400,274
321.1 4,400,275
323.2 4,400,276
441 4,400,277
678 4,400,278
679 4,400,279
802 4,400,280

CLASS 211

87 4,399,917
113 4,399,918

CLASS 215

13 R 4,399,919
211 4,399,920
218 4,399,921

CLASS 219

10.55 M 4,400,604
61 4,400,605
69 M 4,400,606
86.8 4,400,607
107 4,400,608
121 EV 4,400,609
124.02 4,400,610
137 R 4,400,611
405 4,400,612
497 4,400,613
528 4,400,614

CLASS 220

3.6 4,399,922
85 R 4,399,923
257 4,399,924
269 4,399,925
288 4,399,926
307 4,399,927
335 4,399,928

CLASS 222

81 4,399,929
145 4,399,930
282 4,399,931
380 4,399,932
407 4,399,933

CLASS 224

240 4,399,934

CLASS 225

49 4,399,935

CLASS 226

92 4,399,936
162 4,399,937

CLASS 227

132 4,399,938

CLASS 229

52 B 4,399,939

CLASS 235

487 4,400,616

CLASS 236

1 G 4,399,940

CLASS 238

349 4,399,941

CLASS 239

34 4,399,942
125 4,399,943
585 4,399,944
697 4,399,945

CLASS 241

21 4,399,946
46 B 4,399,947
152 A 4,399,948

CLASS 242

1 4,399,949
4 B 4,399,950
18 DD 4,399,951
47.05 4,399,952
47.08 4,399,953
86.52 4,399,954
107.2 4,399,956
107.4 A 4,399,955
130 4,399,957
182 4,399,958
195 4,399,959
199 4,399,960

CLASS 244

3.13 4,399,961
3.23 4,399,962
104 R 4,399,963
113 4,399,964
129.4 4,399,965
4,399,966
134 R 4,399,967
137 R 4,399,968
145 4,399,969
214 4,399,970

CLASS 248

221.3 4,399,971
346 4,399,972
524 4,399,973
605 4,399,974
678 4,399,975

CLASS 250

214 A 4,400,617
302 4,400,618
327.2 4,400,619
363 S 4,400,620
385 4,400,621
396 ML 4,400,622
517.1 4,400,623

CLASS 251

306 4,399,976
315 4,399,977

CLASS 252

8.6 4,400,281
32.7 E 4,400,282
4,400,283
49.6 4,400,284
70 4,400,285
4,400,286
4,400,287
135 4,400,288
142 4,400,289
174.11 4,400,290
188.3 R 4,400,291
189 4,400,292
299.63 4,400,293
301.24 4,400,294
356 4,400,295
364 4,400,296
378 R 4,400,297
400 R 4,400,298
413 4,400,299
414 4,400,300
429 B 4,400,301
4,400,302
430 4,400,303
4,400,304
431 R 4,400,305
455 Z 4,400,306
463 4,400,307
472 4,400,308
514 4,400,309
522 R 4,400,310
545 4,400,311
628 4,400,312
633 4,400,313
4,400,314

CLASS 254

26 R 4,399,978
338 4,399,979

CLASS 256

13.1 4,399,980

CLASS 260

112 R 4,400,315
112.5 R 4,400,316
151 4,400,317
152 4,400,318
155 4,400,319
158 4,400,320
186 4,400,321
205 4,400,322
239 A 4,400,323
369 4,400,324
408 4,400,325
429 R 4,400,326
4,400,327
448 C 4,400,328
455 B 4,400,329
502.5 F 4,400,330
932 4,400,331

CLASS 261

1 4,400,332

CLASS 264

2.7 4,400,333
30 4,400,334
4,400,335
46.7 4,400,336
82 4,400,337
171 4,400,338
206 4,400,339
328.6 4,400,340
328.8 4,400,341
501 4,400,342

CLASS 266

45 4,399,982
176 4,399,983
252 4,399,984
265 4,399,985
272 4,399,986
275 4,399,981

CLASS 267

140.1 4,399,987

CLASS 269

8 4,399,988
87.2 4,399,989

CLASS 271

90 4,399,990
175 4,399,991

CLASS 273

26 B 4,399,996
73 F 4,399,992
73 R 4,399,993
191 R 4,399,994
237 4,399,995

CLASS 277

12 4,399,997
134 4,399,998
199 4,399,999
235 B 4,400,000

CLASS 280

11.28 4,400,001
164 A 4,400,002
278 4,400,003
408 4,400,004
423 B 4,400,005
646 4,400,006
661 4,400,007
666 4,400,008
687 4,400,009
732 4,400,010
748 4,400,011
777 4,400,012
801 4,400,013
804 4,400,014
807 4,400,015

CLASS 283

66 A 4,400,017
66 R 4,400,016

CLASS 285

31 4,400,018
55 4,400,019
204 4,400,020
247 4,400,021
256 4,400,022
302 4,400,023
356 4,400,024

CLASS 289

17 4,400,025

CLASS 292

175 4,400,026
288 4,400,027

CLASS 294

19 R 4,400,028
50.9 4,400,029

CLASS 297

219 4,400,030
239 4,400,031
349 4,400,032
417 4,400,033

CLASS 299

5 4,400,034
11 4,400,035
86 4,400,036

CLASS 301

5 BA 4,400,037
111 4,400,038

CLASS 303

3 4,400,039

CLASS 307

43 4,400,624
66 4,400,625
4,400,626
115 4,400,627
118 4,400,628
127 4,400,629
219.1 4,400,630
245 4,400,631
299 A 4,400,632
351 4,400,633
400 4,400,634
445 4,400,635
446 4,400,636
497 4,400,637

CLASS 308

187 4,400,040
219 4,400,041
227 4,400,042

CLASS 310

95 4,400,638
215 4,400,639
313 A 4,400,640
323 4,400,641
332 4,400,642

CLASS 312

111 4,400,043
204 4,400,044
236 4,400,045
4,400,046

CLASS 313

11.5 4,400,643
256 4,400,644
325 4,400,645
333 4,400,646
346 R 4,400,648
355 4,400,647
414 4,400,649

CLASS 315

5.41 4,400,650
205 4,400,651
387 4,400,652
408 4,400,653

CLASS 318

312 4,400,654
729 4,400,655
798 4,400,656
4,400,657

CLASS 320

26 4,400,658

CLASS 322

32 4,400,659

CLASS 323

270 4,400,660
275 4,400,661
320 4,400,662

CLASS 324

52 4,400,663
83 D 4,400,664
230 4,400,665

CLASS 328

130.1 4,400,666

CLASS 331

1 A 4,400,667
45 4,400,668

CLASS 333

141 4,400,669

CLASS 335

6 4,400,670
56 4,400,671
202 4,400,672

CLASS 336

65 4,400,674
160 4,400,675
205 4,400,676

CLASS 337

6 4,400,677
195 4,400,678
380 4,400,679
415 4,400,680

CLASS 338

4 4,400,681
4,400,682
21 4,400,683
25 4,400,684
172 4,400,685
184 4,400,686
4,400,687

CLASS 339

18 R 4,400,047
46 4,400,048
176 MP 4,400,049
177 R 4,400,050
217 S 4,400,051

CLASS 340

310 R 4,400,688
347 AD 4,400,689
4,400,690
4,400,691
4,400,693
347 DA 4,400,692
505 4,400,694
566 4,400,695
573 4,400,696
711 4,400,697
825.22 4,400,699
825.72 4,400,698

CLASS 343

55 A 4,400,700
725 4,400,701
790 4,400,702
895 4,400,703

CLASS 346

29 4,400,704
75 Re.31,357
Re.31,358
4,400,705
135.1 4,400,706
4,400,707
140 R 4,400,708
154 4,400,709

CLASS 350

96.12 4,400,052
96.15 4,400,053
4,400,054
4,400,055
96.19 4,400,056
162.20 4,400,057
166 4,400,058
332 4,400,059
339 R 4,400,060
350 4,400,061
406 4,400,062
415 4,400,063
426 4,400,064
476 4,400,065
568 4,400,066

CLASS 351

59 4,400,067

CLASS 353

27 R 4,400,068

CLASS 354

11 4,400,069
25 4,400,070
4,400,071
43 4,400,072
173 4,400,073
4,400,074
195 4,400,075
202 4,400,076

CLASS 355

3 DD 4,400,078
3 DR 4,400,077
10 4,400,079
11 4,400,080
15 4,400,081
4,400,082
16 4,400,083
74 4,400,084
76 4,400,085

CLASS 356

36 4,400,086
215 4,400,087
350 4,400,088
382 4,400,089

CLASS 357

15 4,400,710
43 4,400,711
44 4,400,712
45 4,400,713
49 4,400,715
54 4,400,716
70 4,400,714

CLASS 358

13 4,400,717
4,400,718
21 R 4,400,719
25 4,400,720
37 4,400,721
60 4,400,722
4,400,723
85 4,400,724
4,400,725
86 4,400,726
103 4,400,727
107 4,400,728

113 4,400,729
139 4,400,730
4,400,731
147 4,400,732
155 4,400,733
163 4,400,734
181 4,400,735
254 4,400,736
263 4,400,737
283 4,400,738
293 4,400,739
4,400,740
312 4,400,741
318 4,400,742
335 4,400,743

CLASS 360

69 4,400,744
73 4,400,745
77 4,400,746
4,400,747
99 4,400,748
104 4,400,749
105 4,400,750
107 4,400,751
112 4,400,752
133 4,400,753

CLASS 361

38 4,400,754
91 4,400,755
152 4,400,756
236 4,400,757
290 4,400,758
321 4,400,759
4,400,760
332 Re.31,359
400 4,400,761
402 4,400,762

CLASS 362

103 4,400,763
263 4,400,764
277 4,400,765
376 4,400,766

CLASS 363

21 4,400,767

CLASS 364

200 4,400,768
4,400,769
4,400,770
4,400,771
4,400,772
4,400,773
4,400,774
4,400,775
4,400,776
4,400,777
4,400,778
442 4,400,779
449 4,400,780
474 4,400,781
481 4,400,782
483 4,400,783
500 4,400,784
508 4,400,785
513 4,400,786
4,400,787
4,400,788
578 4,400,789
604 4,400,790
900 4,400,791
4,400,792
4,400,793
4,400,794

CLASS 365

1 4,400,795
8 4,400,796
95 4,400,799
174 4,400,797
4,400,798
190 4,400,800
195 4,400,801
226 4,400,802

CLASS 367

88 4,400,803
137 4,400,804
140 4,400,805

CLASS 368

9 4,400,090
80 4,400,091
82 4,400,092
200 4,400,093
266 4,400,094
321 4,400,095

CLASS 369

170 4,400,806
220 4,400,807
262 4,400,808

CLASS 371

27 4,400,809
40 4,400,810
69 4,400,811

CLASS 372

29 4,400,812
45 4,400,813
94 4,400,814

CLASS 373

92 4,400,815
104 4,400,816

CLASS 374

25 4,400,096
121 4,400,097

CLASS 375

119 4,400,817

CLASS 376

272 4,400,344
292 4,400,345
327 4,400,346
333 4,400,347
417 4,400,343

CLASS 377

28 4,400,615
54 4,400,818

CLASS 378

20 4,400,819
97 4,400,821
103 4,400,822
113 4,400,823
141 4,400,824
150 4,400,825
178 4,400,826
207 4,400,827
209 4,400,820

CLASS 382

30 4,400,828

CLASS 384

99 4,400,098
283 4,400,099

CLASS 400

120 4,400,100
124 4,400,101
4,400,102
208 4,400,103
320 4,400,104
616.1 4,400,105
617 4,400,106

CLASS 402

4 4,400,107

CLASS 405

155 4,400,108
195 4,400,109
4,400,110
196 4,400,111
224 4,400,112
261 4,400,113
303 4,400,114
4,400,115

CLASS 406

20 4,399,817

CLASS 407

3 4,400,116
49 4,400,117

CLASS 408

3 4,400,118
230 4,400,119

CLASS 409

132 4,400,120

CLASS 410

64 4,400,121

CLASS 411

67 4,400,122
373 4,400,123

CLASS 414

43 4,400,124
187 4,400,125
332 4,400,126
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417 4,400,128
462 4,400,129
478 4,400,130
491 4,400,131
569 4,400,132
589 4,400,133

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134 4,400,135
140 4,400,136

CLASS 416

220 R 4,400,137

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179 4,400,138
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354 4,400,140
360 4,400,141
372 4,400,142
374 4,400,143
415 4,400,144

CLASS 418

61 A 4,400,145
131 4,400,146
206 4,400,147

CLASS 419

49 Re.31,355

CLASS 420

443 4,400,209
4,400,210
4,400,211
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489 4,400,351

CLASS 422

4 4,400,352
73 4,400,353
78 4,400,354
170 4,400,355
171 4,400,356
297 4,400,357

CLASS 423

2 4,400,358
15 4,400,359
21.1 4,400,360
226 4,400,361
235 4,400,362
239 4,400,363
247 4,400,364
306 4,400,365
329 4,400,366
463 4,400,367
573 R 4,400,368
574 R 4,400,369

CLASS 424

3 4,400,370
10 4,400,371
48 4,400,372
49 4,400,373
78 4,400,374
85 4,400,375
88 4,400,376
177 4,400,377
244 4,400,378
246 4,400,379
248.5 4,400,380
248.52 4,400,381
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256 4,400,384
258 4,400,385
4,400,386
263 4,400,387
269 4,400,388
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301 4,400,390
304 4,400,391
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319 4,400,394
4,400,395
325 4,400,396
329 4,400,397

CLASS 425

155 4,400,148
262 4,400,149

CLASS 426

1 4,400,399
51 4,400,400
234 4,400,401
429 4,400,398
471 4,400,402
532 4,400,403
549 4,400,404
565 4,400,405
4,400,406

CLASS 427

8 4,400,407
35 4,400,408
39 4,400,409
4,400,410
86 4,400,411
87 4,400,412
136 4,400,413
210 4,400,414
305 4,400,415
434.5 4,400,416

CLASS 428

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36 4,400,418
40 4,400,419
99 4,400,420
113 4,400,421
160 4,400,422
204 4,400,423
212 4,400,424
246 4,400,425
290 4,400,426
332 4,400,427
349 4,400,428
379 4,400,429
383 4,400,430
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408 4,400,433
421 4,400,434
425.9 4,400,435
434 4,400,436
447 4,400,437
458 4,400,438
478.2 4,400,439
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544 4,400,442
571 4,400,443
694 4,400,444
700 4,400,445

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27 4,400,447
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86 4,400,450
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196 4,400,453

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138 4,400,456
140 4,400,457
157 4,400,458
306 4,400,459
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311 4,400,461
415 4,400,462
434 4,400,463

CLASS 431

170 4,400,150
184 4,400,151
328 4,400,152

CLASS 432

103 4,400,153
115 4,400,154
151 4,400,155
222 4,400,156

CLASS 433

31 4,400,157
127 4,400,158
202 4,400,159
224 4,400,160

CLASS 434

104 4,400,161
291 4,400,162

CLASS 435

21 4,400,464
71 4,400,465
101 4,400,466
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142 4,400,468
161 4,400,469
162 4,400,470
232 4,400,471
235 4,400,472

CLASS 440

75 4,400,163

CLASS 474

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CLASS 493

457 4,400,165

CLASS 494

20 4,400,166
49 4,400,167

CLASS 501

77 4,400,473
119 4,400,474

CLASS 521

103 4,400,475
107 4,400,476
112 4,400,477

CLASS 523

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CLASS 524

38 4,400,479
47 4,400,480
55 4,400,481
114 4,400,482
176 4,400,495
247 4,400,483
296 4,400,484
444 4,400,485

CLASS 525

57 4,400,486
199 4,400,487
211 4,400,488
301.5 4,400,489
423 4,400,490
439 4,400,491
506 4,400,492

CLASS 526

68 4,400,493
119 4,400,494

CLASS 527

312 4,400,496

CLASS 528

45 4,400,497
60 4,400,498
174 4,400,499
345 4,400,500
496 4,400,501

CLASS 536

87 4,400,502

CLASS 544

28 4,400,503
76 4,400,504
198 4,400,505
246 4,400,506
300 4,400,507
313 4,400,508
315 4,400,509
347 4,400,510
349 4,400,511

CLASS 546

16 4,400,512
4,400,513
51 4,400,514
57 4,400,515
276 4,400,516

CLASS 548

118 4,400,517
433 4,400,518
461 4,400,519
472 4,400,520
549 4,400,521

CLASS 549

260 4,400,522
320 4,400,523
369 4,400,524
552 4,400,525

CLASS 556

420 4,400,526
422 4,400,527
430 4,400,528

CLASS 560

16 4,400,529
21 4,400,530
201 4,400,531
227 4,400,532

CLASS 562

443 4,400,533
468 4,400,534
584 4,400,535

CLASS 564

127 Re.31,356
269 4,400,536
402 4,400,537
423 4,400,538
480 4,400,539

CLASS 568

31 4,400,540
56 4,400,541
315 4,400,542
327 4,400,543
360 4,400,544
377 4,400,545
386 4,400,546
454 4,400,547
4,400,548
4,400,549
486 4,400,550
487 4,400,551
715 4,400,552
724 4,400,553
727 4,400,554
728 4,400,555
776 4,400,556
804 4,400,557
810 4,400,558
858 4,400,559
863 4,400,560
902 4,400,561
903 4,400,562

CLASS 570

144 4,400,563

CLASS 585

10 4,400,565
359 4,400,566
428 4,400,567
443 4,400,568
444 4,400,569
467 4,400,570
480 4,400,571
481 4,400,572
4,400,573
671 4,400,574
733 4,400,575
739 4,400,576
845 4,400,564

CLASS 604

48 4,400,168
49 4,400,169
62 4,400,170
68 4,400,171
70 4,400,172

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D2—	28	270,204			270,220		309	270,236	D16—	31	270,252	D22—	1	270,264		64	270,284
	272	270,205	D7—	17	270,221		341	270,237			270,253		13	270,265	D25—	38	270,285
	395	270,206		76	270,222		353	270,238	D17—	14	270,254		18	270,266		63	270,286
D3—	34	270,207		330	270,223		398	270,239		17	270,255		19	270,267		74	270,287
	71	270,208		351	270,224		401	270,240		20	270,270		24	270,268			270,288
	73	270,209		357	270,225		435	270,241	D18—	27	270,271		27	270,269			270,289
D6—	7	270,210	D8—	13	270,226			270,242			270,272	D23—	7	270,274		84	270,290
		270,211		25	270,227	D10—	30	270,243	D19—	52	270,273		139	270,275			270,291
	37	270,212		70	270,228			270,244		77	270,256		153	270,276			
	63	270,213		331	270,229	D12—	96	270,245	D20—	10	270,257	D24—	1.1	270,277		91	270,292
	70	270,214		350	270,230	D13—	30	270,246	D21—	31	270,258		17	270,278	D26—	42	270,293
	73	270,215			270,231			270,247		89	270,259		36	270,279		93	270,294
	85	270,216		353	270,232	D14—	53	270,248		111	270,260		41	270,280	D27—	51	270,295
	161	270,217		356	270,233			270,249		143	270,261		53	270,281	D28—	31	270,296
	168	270,218		402	270,234		111	270,250		198	270,262		54	270,282	D30—	1	270,297
	186	270,219	D9—	300	270,235	D15—	123	270,251			270,263		62	270,283	D32—	21	270,298

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P.—	7	5,089			5,090		9	5,091		10	5,092						

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4 :	4,400,016	4,399,999	4,400,805	4,399,939	4,400,587	4,399,579
6 :	4,399,658	4,400,028	4,400,812	4,399,973	4,400,626	4,399,581
	4,399,726	4,400,031	08 : 4,399,634	4,399,975	20 : 4,399,730	4,399,586
	4,399,832	4,400,037	4,399,909	4,399,978	4,399,739	4,399,600
	4,399,837	4,400,049	4,400,717	4,400,000	4,400,361	4,399,627
	4,400,042	4,400,066	09 : 4,399,667	4,400,001	21 : 4,399,856	4,399,630
	4,400,246	4,400,078	4,399,803	4,400,053	4,399,953	4,399,635
	4,400,447	4,400,103	4,399,804	4,400,147	22 : 4,400,262	4,399,639
	4,400,457	4,400,108	4,399,937	4,400,230	4,400,299	4,399,662
8 :	4,400,007	4,400,109	4,400,048	4,400,419	4,400,366	4,399,668
9 :	4,400,354	4,400,114	4,400,149	4,400,441	4,400,391	4,399,678
01 :	4,399,782	4,400,125	4,400,215	4,400,481	23 : 4,399,913	4,399,742
	4,399,961	4,400,138	4,400,356	4,400,494	24 : 4,399,638	4,399,750
	4,400,256	4,400,159	4,400,385	4,400,537	4,399,732	4,399,799
	4,400,657	4,400,166	4,400,434	4,400,571	4,399,806	4,399,859
04 :	4,399,578	4,400,170	4,400,475	4,400,573	4,399,982	4,399,894
	4,399,936	4,400,191	4,400,603	4,400,584	4,400,086	4,399,907
	4,399,959	4,400,200	4,400,804	4,400,585	4,400,423	4,399,929
	4,400,050	4,400,202	10 : 4,399,885	4,400,589	4,400,562	4,399,940
	4,400,185	4,400,203	4,400,340	4,400,623	4,400,729	4,399,996
	4,400,595	4,400,204	11 : 4,399,979	4,400,627	25 : 4,399,690	4,400,008
	4,400,640	4,400,228	4,400,724	4,400,628	4,399,769	4,400,105
	4,400,664	4,400,244	12 : 4,399,582	4,400,645	4,399,787	4,400,117
	4,400,756	4,400,269	4,399,696	4,400,723	4,399,794	4,400,144
05 :	4,399,571	4,400,272	4,399,784	4,400,735	4,399,814	4,400,150
	4,399,611	4,400,284	4,399,811	4,400,736	4,399,992	4,400,187
06 :	Re.31,357	4,400,314	4,399,930	4,400,774	4,400,004	4,400,216
	4,399,570	4,400,330	4,399,932	4,400,817	4,400,029	4,400,248
	4,399,575	4,400,341	4,400,162	18 : 4,399,592	4,400,043	4,400,313
	4,399,594	4,400,401	4,400,355	4,399,653	4,400,069	4,400,326
	4,399,629	4,400,407	4,400,496	4,399,713	4,400,107	4,400,336
	4,399,631	4,400,442	4,400,620	4,399,744	4,400,160	4,400,402
	4,399,654	4,400,467	4,400,660	4,399,955	4,400,190	4,400,404
	4,399,683	4,400,469	4,400,667	4,399,972	4,400,212	4,400,409
	4,399,684	4,400,485	4,400,763	4,399,986	4,400,231	4,400,440
	4,399,687	4,400,529	4,400,790	4,400,005	4,400,427	4,400,446
	4,399,711	4,400,577	4,400,794	4,400,135	4,400,452	4,400,516
	4,399,764	4,400,581	13 : 4,399,573	4,400,223	4,400,532	4,400,518
	4,399,807	4,400,586	4,399,602	4,400,245	4,400,554	4,400,524
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	4,399,821	4,400,597	4,399,916	4,400,375	4,400,596	27 : 4,399,577
	4,399,835	4,400,614	4,399,922	4,400,503	4,400,655	4,399,637
	4,399,865	4,400,650	4,400,405	4,400,510	4,400,677	4,399,672
	4,399,872	4,400,662	4,400,406	4,400,543	4,400,688	4,399,707
	4,399,910	4,400,698	15 : 4,399,666	4,400,599	4,400,689	4,399,915
	4,399,931	4,400,708	17 : Re.31,353	4,400,681	4,400,690	4,400,058
	4,399,934	4,400,721	4,399,721	4,400,685	4,400,767	4,400,145
	4,399,942	4,400,728	4,399,793	4,400,733	4,400,788	4,400,386
	4,399,947	4,400,745	4,399,816	4,400,806	4,400,827	4,400,443
	4,399,962	4,400,750	4,399,863	19 : 4,399,783	26 : Re.31,355	4,400,654
	4,399,967	4,400,772	4,399,875	4,399,886	Re.31,356	4,400,747
	4,399,969	4,400,799	4,399,893	4,399,896	Re.31,359	4,400,766
	4,399,993	4,400,803	4,399,928	4,400,002	4,399,569	28 : 4,400,157

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DESIGN PATENTS

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04 : 270,244
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06 : 270,204
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